Robust Summary
Alga Toxicity

Test Substance:	Low Dicyclopentadiene Resin Oil (Low DCPD Resin Oil) CAS No. 68477-54-3. Distillates, petroleum, steam-cracked, C8-12 fraction. This stream can also be described by CAS No. 68516-20-1. Naphtha, petroleum, steam-cracked middle arom. Low DCPD Resin Oil is a C8 to C10 distillate obtained from a pyrolysis gasoline stream produced by an ethylene production process (steam cracking process). The sample tested consisted of vinyltoluenes (17%), trimethylbenzenes (9%), styrene and methylstyrenes (3%), indene (14%), methylindene (8%), and naphthalene (1%). The balance of the composition is expected to consist of other hydrocarbons with carbon range primarily 8 to 10, mainly aromatics and olefins, with some paraffins.
Method/Guideline:	OECD Guideline 201
Year (guideline):	1984
Type (test type):	Alga Toxicity Test
GLP (Y/N):	Yes
Year (study performed):	2003
Species:	*Pseudokirchneriella subcapitata*
Analytical Monitoring:	Yes
Exposure Period:	96 hours
Statistical Method:	The E_bC_{50}, E_rC_{50} and confidence intervals for inhibition of growth/growth rate slope were determined based on the linear regression Snedecor and Cochran (1989). Confidence intervals for the E_bC_{50} were calculated using the inverse interpolation equations from section 9.12 of Snedecor and Cochran (1989). Calculations were based on the PROC REGRESSION procedure and standard data manipulation methods in SAS (2002). The NOEC for the E_bC_{50} and E_rC_{50} was based on Duncan's (1975) Multiple Range test and Dunnett's (1964) test, determined from the GLM procedure of SAS (2002). The Shapiro-Wilk (1965) test for normality was used to test if the assumption of normality of the residuals was met; since the residuals were normally distributed the NOEC was based on the estimated values. Snedecor, G.W. and W.G. Cochran 1989, *Statistical Methods*, 8th Edition. Iowa State University Press / Ames. SAS Version 8, SAS Institute, Inc., Cary, NC. 2002. Duncan, D.B. 1975, "t-Tests and Intervals for Comparisons Suggested by the Data", Biometrics, 31, 339-359. Dunnett, C. 1964, "New Tables for Multiple Comparisons With A Control", Biometrics, Vol 20, No. 3, pg 482-491. Shapiro, S.S. and Wilk, M.B. 1965,"n analysis of variance test for normality (complete samples)" Biometrika, 52, pg 591-611.

Test Conditions: • **Note: Concentration preparation, vessel type, volume, replication, environmental conditions, organisms supplier, loading, deviations from guideline or protocol.**	Individual Water Accommodated Fractions (WAF's) were prepared for each treatment. The test substance was added to 4.3 L of algal nutrient medium augmented with sodium bicarbonate in glass aspirator bottles (capacity 4.5 L). The solutions were mixed for approximately 24 hours using an 9% vortex (of the static liquid depth). The test solutions were removed through the outlet at the bottom of each mixing vessel into 12 replicates of 140 mL in 125 mL Erlenmeyer flasks (no headspace) containing two 14 mm glass spheres to facilitate mixing. The test chambers were inoculated with algae (1.0×10^4 cells/mL) and were sealed with ground glass stoppers. Three replicates were sacrificed daily for cell density determination. The test chambers were placed on shaker tables (100 rpm) to keep the algae in suspension. The test was performed under static conditions with no aeration. The algae was cultured in-house from 5 day old stock cultures in log phase growth. Mean test temperature: 24.4°C (sd = 0.1). Continuous light: intensity was 8657 to 8813 Lux. The pH ranged from 7.5 to 7.6 in the test solutions at test initiation and ranged from 8.2 to 10.2 at test termination. Due to the complex nature and limited water solubility of the test substance, the following exceptions to the guideline apply for this study: The concentration of the test substance in solution was not determined prior to use. Test substance analysis was performed on samples of the WAFs at the start of the test (day 0) and at termination (day 4). The initial concentration of the test substance was not maintained at 80% in the three lower loading rates throughout the test (this may be due to biological activity or physical processes in the test chambers). It was appropriate to prepare individual treatment solutions by adding the test substance to dilution water and removing the WAF of each mixture for testing than to prepare dilutions of a stock solution. The test duration was 96 hours, instead of 72 hours. However, both 72 and 96-hour endpoints were determined. None of the above exceptions are believed to have affected the outcome, integrity, or quality of the study.
Results: **Units/Value:** **Note: Analytical method, biological observations, control survival.**	Effects on growth rate (r) based upon actual loading rates: 72 and 96 hr ErL50 = 1.5 mg/L (<0.23* - >7.3* mg/L) 72 hr NOELR = 0.46 mg/L 96 hr NOELR = 1.1 mg/L Effects on biomass (b) based upon actual loading rates: 72 hr EbL50 = 2.1 mg/L (<0.23* - >7.3* mg/L) 96 hr EbL50 = 1.9 mg/L (<0.23* - >7.3* mg/L) 72 hr NOELR = 0.23 mg/L 96 hr NOELR = <0.23 mg/L Effects on growth rate (r) based upon measured concentrations: 72 hr ErC50 = 1.4 mg/L (0.27 - >7.4* mg/L) 96 hr ErC50 = 1.4 mg/L (<0.27* - >7.4* mg/L) 72 hr NOEC = 0.37 mg/L 96 hr NOEC = 0.94 mg/L Effects on biomass (b) based upon measured concentrations: 72 hr EbC50 = 2.0 mg/L (<0.27* - >7.4* mg/L) 96 hr EbC50 = 1.9 mg/L (<0.27* - >7.4* mg/L) 72 hr NOEC = 0.27 mg/L 96 hr NOEC = <0.27 mg/L Values in parentheses are 95% confidence intervals. * Confidence interval exceeded the highest or lowest loading rate or concentration tested.

	The analytical method used was static headspace gas chromatography with flame ionization detection. Summary of In-Life observations - % Inhibition Loading Rate (mg/L) Control 0.23 0.46 1.1 2.7 7.3 Meas. Conc. (mg/L) 0 0.27 0.37 0.94 2.7 7.4 Based on Growth Rate 72 hours n/a 3.5 4.3 5.6 85 100 96 hours n/a 2.7 2.0 2.8 93 100 Based on Biomass 72 hours n/a 8.9 18 23 95 98 96 hours n/a 9.2 15 19 98 100
Conclusions:	Effects on growth rate (r) based upon actual loading rates: 72 hr and 96 hr ErL50 = 1.5 mg/L 72 hr NOELR = 0.46 mg/L 96 hr NOELR = 1.1 mg/L Effects on biomass (b) based upon actual loading rates: 72 hr EbL50 = 2.1 mg/L 96 hr EbL50 = 1.9 mg/L 72 hr NOELR = 0.23 mg/L 96 hr NOELR = <0.23 mg/L Effects on growth rate (r) based upon measured concentrations: 72 and 96 hr ErC50 = 1.4 mg/L 72 hr NOEC = 0.37 mg/L 96 hr NOEC = 0.94 mg/L Effects on biomass (b) based upon measured concentrations: 72 hr EbC50 = 2.0 mg/L 96 hr EbC50 = 1.9 mg/L 72 hr NOEC = 0.27 mg/L 96 hr NOEC = <0.27 mg/L
Reliability:	(1)-Reliable without restrictions.
Reference:	ExxonMobil Biomedical Sciences, Inc. 2003. ALGA, GROWTH INHIBITION TEST on LOW DICYCLOPENTADIENE RESIN OIL. Study # 163067.
Other (source):	Olefins Panel, American Chemistry Council

Robust Summary
Biodegradation

Test Substance:	CAS No.: 26472-00-4, Methylcyclopentadiene Dimer Concentrate (MCPD Dimer Concentrate). The test substance contained 90.8% MCPD Dimer, 2.6% MCPD and 1.6% Cyclopentadiene (CPD)-MCPD codimer. The balance of the stream consisted of other hydrocarbons, primarily C4-C7 codimers of MCPD or CPD. CAS Inventory Name: 4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydrodimethyl-
Method/Guideline:	OECD Guideline 301F
Year (guideline):	1992
Type (test type):	Ready Biodegradability: Manometric Respirometry Test
GLP (Y/N):	Yes
Year (study performed):	2002
Inoculum:	Domestic activated sludge
Exposure Period:	28 Days
Test Conditions: • **Note: Concentration preparation, vessel type, replication, test conditions.**	Triplicate test systems were used to evaluate the biodegradability of the test and positive control substances at mean concentrations of 49.77 mg/L and 48.49 mg/L, respectively. Blank test systems, which did not contain the test or positive control substance, were run concurrently in triplicate. The total suspended solids (TSS) of the activated sludge was determined to be 3.74 g/L. The inoculum was added at a 1% loading volume of sludge supernatant to test medium. The microbial count of the inoculum was 10^5 CFU/mL. One liter of test medium, which was aerated for 24 hours with carbon dioxide free air, was added to each one liter respirometer flask. The test substance was weighed in an air tight syringe and injected into the test medium. The test system was sealed immediately after addition of the test substance. An aliquot of the positive control stock solution was added to the appropriate test flasks. An unacclimated activated sludge inoculum was used in this study. The inoculum was obtained from the Clinton Sanitary Wastewater Treatment Plant, Annandale, NJ, USA. The treatment plant receives domestic sewage. All test systems were placed on a Coordinated Environmental Services (CES) automated respirometer which automatically recorded the oxygen uptake in general agreement with the OECD guideline. The 28-day study was conducted at a temperature range of 21.2°C to 21.7°C.

Results: **Units/Value:** **Note: Deviations from protocol or guideline, analytical method.**	Biodegradation was based on oxygen consumption and the theoretical oxygen demand of the test substance as calculated using results of an elemental analysis of the test substance. By day 14, >60% biodegradation of positive control was observed, which meets the guideline requirement. No deviations from the protocol occurred that affected the integrity of the study data. No biodegradation was observed in each of the triplicate test substance systems, therefore the test substance cannot be considered readily biodegradable. Sample — % Degradation* (day 28) — Mean % Degradation (day 28) Test Substance — 0, 0, 0 — 0 Na Benzoate — 92, 109, 93 — 98 * replicate data
Conclusion:	Not readily biodegradable
Reliability:	(1)-Reliable without restriction.
Reference:	ExxonMobil Biomedical Sciences, Inc. 2002. Ready Biodegradability: Manometric Respirometry test. Study # 154594A
Other (source): (FT - SO)	Olefins Panel, American Chemistry Council

Boiling Point

Test Substance:	CAS No.: 26472-00-4, Methylcyclopentadiene Dimer Concentrate (MCPD Dimer Concentrate). The test substance contained 90.8% MCPD Dimer, 2.6% MCPD and 1.6% Cyclopentadiene (CPD)-MCPD codimer. The balance of the stream consisted of other hydrocarbons, primarily C4-C7 codimers of MCPD or CPD. CAS Inventory Name: 4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydrodimethyl-
Method/Guideline:	EEC A2 / OECD 103
Year (guideline):	1993 / 1995
Type (test type):	Boiling Point (modified Siwoloboff method)
GLP:	Yes
Year (study performed):	2003
Pressure	Corrected to Standard Atmospheric
Boiling Point Value:	191.0 Deg C
Test Conditions: • **Note: Concentration prep., vessel type, replication, test conditions.**	Boiling tube filled with test substance which is placed in Buchi Model B-545 boiling point apparatus. Temperature of apparatus set approximately 10 Deg C below anticipated boiling point. Temperature raised approximately 1 Deg C/min. Temperature recorded at which a continuous stream of bubbles is seen emerging from the inverted open end of boiling point tube. Procedure performed in duplicate.
Results: **Units/Value:**	Results of duplicate measurements: Run I 190.5 Deg C Run II 191.0 Deg C Mean 191.0 Deg C A slight yellow color was noted upon boiling, possibly decomposition of a minor component.
Reliability:	(1) Reliable without restriction
Reference:	Huntingdon Life Sciences, Ltd. 2003, Physicochemical Properties for Methylcyclopentadiene Concentrate Study EXN040/032421.
Other (source):	Olefins Panel, American Chemistry Council

Partition Coefficient

Test Substance:	CAS No.: 26472-00-4, Methylcyclopentadiene Dimer Concentrate (MCPD Dimer Concentrate). The test substance contained 90.8% MCPD Dimer, 2.6% MCPD and 1.6% Cyclopentadiene (CPD)-MCPD codimer. The balance of the stream consisted of other hydrocarbons, primarily C4-C7 codimers of MCPD or CPD. CAS Inventory Name: 4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydrodimethyl-
Method/Guideline:	EEC A8 / OECD 117
Year (guideline):	1993 / 1989
Type (test type):	N-Octanol/Water Partition Coefficient (HPLC method)
GLP:	Yes
Year (study performed):	2003
Temperature:	25 Deg C
Log P_{ow} Value:	5.5 - 5.7
Test Conditions:	
• **Note: Concentration prep., vessel type, replication, test conditions.**	Test substance was evaluated at a concentration of 271 mg/L prepared in HPLC mobile phase (3:1 methanol:water). HPLC analysis was performed on a Hewlett Packard 1050 Liquid Chromatograph with an Inertsil 5um C8 (15cm x 4.6mm id) column with a 1 mL/min flow rate, 10uL injection volume and UV detection at 210 nm. Six reference compounds (with known log P_{ow} values), each at approximately 50 mg/L , were analyzed in a combined solution including nitrobenzene (1.9), ethylbenzoate (2.6), bromobenzene (3.0), benzylbenzoate (4.0), triphenylamine (5.7) and DDT (6.2). Additionally, an unretained standard of 4,5-dihydroxynaphthalene-2,7-disulphonic acid, disodium salt was analyzed to determine the system deadtime. Two sets of reference mixture and test substance runs were performed.
Results:	
Units/Value:	Three principal components detected with Log P_{ow} values between 5.5 and 5.7 (calculated from the mean exponential regression of reference compounds).
Reliability:	(1) Reliable without restriction
Reference:	Huntingdon Life Sciences, Ltd. 2003, Physicochemical Properties for Methylcyclopentadiene Concentrate Study EXN040/032421.
Other (source):	Olefins Panel, American Chemistry Council

Vapor Pressure

Test Substance:	CAS No.: 26472-00-4, Methylcyclopentadiene Dimer Concentrate (MCPD Dimer Concentrate). The test substance contained 90.8% MCPD Dimer, 2.6% MCPD and 1.6% Cyclopentadiene (CPD)-MCPD codimer. The balance of the stream consisted of other hydrocarbons, primarily C4-C7 codimers of MCPD or CPD. CAS Inventory Name: 4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydrodimethyl-
Method/Guideline:	EEC A4 / OECD 104
Year (guideline):	1993 / 1995
Type (test type):	Vapor Pressure (static measurement procedure)
GLP:	Yes
Year (study performed):	2003
Temperature:	25 Deg C
Vapor Pressure Value:	1900 Pa
Test Conditions: • **Note: Concentration prep., vessel type, replication, test conditions.**	Test conducted at five temperatures between 303 and 323 Deg K (30 and 50 Deg C). Actual test temperatures were 303.15, 308.15, 313.15, 318.15 and 323.15). Duplicate measurements made at each temperature.
Results: **Units/Value:**	Mean vapor pressures were as follows: 2500 Pa at 303.15 Deg K 3800 Pa at 308.15 Deg K 5200 Pa at 313.15 Deg K 7000 Pa at 318.15 Deg K 9400 Pa at 323.15 Deg K 1900 Pa at 25 Deg C (calculated from linear regression)
Reliability:	(1) Reliable without restriction
Reference:	Huntingdon Life Sciences, Ltd. 2003, Physicochemical Properties for Methylcyclopentadiene Concentrate Study EXN040/032421.
Other (source):	Olefins Panel, American Chemistry Council

Robust Summary: Resin Oils and Cyclodiene Dimer Concentrates Category

Genetic Toxicity - in Vitro

Test Substance	
Test substance	Methylcyclopentadiene Dimer (MCDP Dimer), CAS #26472-00-4, purity 90%; stable at room temperature below 70 F; clear colorless liquid
Method	
Method/guideline followed	OECD guideline 471 (adopted 7/21/97); EC Commission Directive 2000/32/EC Annex4D No. L136
System of testing	*Salmonella typhimurium* and *Escherichia coli* with and without metabolic activation
GLP	Yes
Year	2003
Species/Strain	*S. typhimurium* TA98, TA100, TA1535, TA1537 and *E. coli* WP2 *uvr*A.
Metabolic activation	Yes
Species and cell type	Sprague-Dawley rat liver (S9 fraction) prepared in-house
Quantity	10% S9 in S9 mix
Induced or not induced	Aroclor 1254 induced, rats were given 500mg/kg ip 5 days prior to sacrifice
Concentrations tested	0, 15, 50, 150, 500, 1500, 5000 µg/plate
Statistical Methods	None.
Remarks for Test Conditions	Criteria for positive response were a dose-related increase in the mean revertants per plate of at least one tester strain over a minimum of two increasing concentrations as specified below: TA 1535, TA 1537: At the peak of the dose response an equal to or greater than 3.0-fold dose related increase over solvent control values with or without metabolic activation. TA98, TA100, E. coli WP2 *u*vrA: At the peak of the dose response an equal to or greater than 2.0-fold dose related increase over solvent control values with or without metabolic activation. Negative controls: Based on historical control data, all tester strains must exhibit characteristic numbers of spontaneous revertants per plate. Positive controls: The mean of each positive control value must exhibit at least a 3.0-fold increase over the respective mean negative control value (vehicle) for each tester strain. MCDP Dimer test solutions were prepared in DMSO (for the preliminary toxicity assay), or in ethanol (for the mutagenicity test) immediately prior to use. *Salmonella* strains and *E. coli* WP2 *uvr*A (approx. 10^9 cells/ml) were exposed to either test solution or vehicle ±S9 by the plate incorporation method. The preliminary toxicity assay was conducted prior to the mutagenicity test with all tester strains over a range of 6.7-5000 µg/plate (one plate per dose) ±S9. The dose levels tested in the mutagenicity test were 15, 50, 150, 500, 1500 and 5000 µg/plate ±S9. The mutagenicity test was conducted on triplicate plates per dose. Five hundred (500) microliter of S9 or Sham mix, 100 µl of tester strain and 50 µl vehicle or test substance dilution were added to 2.0 mL of molten selective top agar at 45±2 °C. After vortexing, the mixture was overlaid onto the surface of minimal agar plates. After the overlay had solidified, the plates were inverted and incubated for approximately 48 to 72 hours at 37±2 °C. Revertant colonies for a given tester strain and activation condition, except for the positive controls, were counted either entirely by automated colony counter or entirely by hand unless the plate exhibited toxicity, and conditions of background lawn and precipitation were evaluated. Positive control compounds for the –S9 condition were: 2-nitrofluorene (1.0 µg/plate) for TA98; sodium azide (1.0 µg/plate) for TA100 and TA1535; 9-aminoacridine (75 µg/plate) for TA1537; and methyl

	methanesulfonate (1000 µg/plate) for WP2*uvr*A. The positive control compound for the +S9 condition was 2-aminoanthracene, 1.0 µg/plate for all *Salmonella* strains, and 10 µg/plate for WP2*uvr*A.
Results Genotoxic effects	In the preliminary toxicity test, the maximum dose tested was 5000 µg per plate; this dose was achieved using a concentration of 100 mg/mL and a 50 µL plating aliquot. The dose levels tested were 6.7, 10, 33, 67, 100, 333, 667, 1000, 3333 and 5000 µg per plate. Due to contamination, tester strain WP2 *uvr*A was not counted. However, background evaluations were performed and neither precipitate nor toxicity was observed. No precipitate was observed but toxicity was observed beginning at 333, 667, 1000 or 3333 µg per plate with most *Salmonella* conditions. Based on the findings of the toxicity test, the maximum dose plated in the mutagenicity test was 5000 µg per plate. Since the test substance formed a workable suspension in dimethyl sulfoxide (DMSO) at 100 mg/mL this concentration allowed the bacterial mutation test to achieve the regulatory-required top dose level of 5 mg per plate. However, other genetic toxicology assays that may be conducted could not achieve their regulatory-required top dose levels with DMSO as the vehicle. The test substance was soluble in ethanol at 500 mg/mL, a concentration that permits the standard genetic toxicology assays to achieve their regulatory-required top doses. For this reason the test substance vehicle was changed from DMSO to ethanol for the mutagenicity assay. In the mutagenicity test, the maximum dose tested was 5000 µg per plate; this dose was achieved using a concentration of 100 mg/mL The test substance solution was clear at this concentration. The dose levels tested were 15, 50, 150, 500, 1500 and 5000 µg per plate. No precipitate was observed. Toxicity was observed beginning at 500, 1500 or at 5000 µg per plate with some *Salmonella* strains. No toxicity was observed with *E. coli*. MCPD Dimer did not induce a dose-related or 2.0-fold or 3.0-fold increase in the number of revertant colonies in any *Salmonella* strain or in *E. coli* WP2 *u*vrA ±S9. The vehicle controls were acceptable, and the positive control compounds responded appropriately.
Conclusions	Methylcyclopentadiene Dimer did not induce a significant increase in revertant colonies in *Salmonella* strains or in *E.coli* WP2 *uvr*A with or without rat liver metabolic activation at any dose level and is not considered a mutagen in this test system.
Data Quality *Reliabilities*	**1.** Reliable without restrictions
Reference	Wagner, III, V.O, and Klug, M.L. 2003. Methylcyclopentadiene Dimer: Bacterial Reverse Mutation Test. BioReliance Study No. AA69CJ.502.BTL. Unpublished Report (DuPont-11631)
Other *Last changed*	02/13/03

Resin Oils and Cyclodiene Dimer Concentrates Category

Genetic Toxicity - In Vivo

Test Substance	
Remarks	Methylcyclopentadiene Dimer (MCPD Dimer), CAS #26472-00-4, purity 90%; stable at room temperature below 70 F; clear colorless liquid The test substance is a sample of an industrial intermediate stream that is produced by thermal processing and distillation of a pyrolysis gasoline fraction from the ethylene production manufacturing process. The sample tested contained 98.8% MCPD dimers, 2.6% MCPD monomer, 1.6% other C5-C8 monomers, 1.6% CPD-MDCP codimer, 3.0% DCPD and codimers of CPD or MCPD with C4 through C7 monomers and 0.4% trimers of MCPD and DCPD.
Method	
Methods/guidelines followed	OPPTS 870.5395 OECD 474 EC Commission Directive 2000/32/EC
Type	Mammalian erythrocyte micronucleus assay
GLP	Yes
Year	2003
Species	Mouse
Strain	Crl:CD-1®(ICR)BR
Sex	Male and female
Route of administration	Twice by oral intubation, at an approximately 24-hour interval
Vehicle	Corn oil
Doses/concentration levels	0, 500, 1000, or 2000 mg/kg body weight
No. of animals per dose	5/sex/group (0, 500, or 1000 mg/kg body weight), 7/sex/group (2000 mg/kg body weight)
Control groups and treatment	5/sex vehicle control animals (corn oil); 5/sex positive control (cyclophosphamide, 30 mg/kg once by oral intubation)
Statistical methods	Total polychromatic erythrocytes (PCEs), micronucleated polychromatic erythrocytes, normochromatic erythrocytes (NCEs) were compared to the control using Dunnett's and Dunn's test ($p < 0.05$).
Test Conditions.	Groups of 5 mice/sex/group (7 mice/sex at the highest dose level) were administered the test substance twice at an approximately 24 hour interval by oral intubation (gavage). Body weights ranged from 24.9-30.8 g (males) and 19.3-25.3 g (females) at time of arrival. The animals were approximately 7 weeks old (51 days) at time of exposure. The homogeneity / concentration of the dosing formulations and the test substance stability were verified analytically. The mice were weighed prior to treatment and sacrifice. The mice were observed for clinical signs and mortality/moribundity prior to treatment, approximately 1 hour post dosing, 3-5 hours post-dosing, and prior to sacrifice. The mice were sacrificed approximately 24 hours after administration of the second dose and smears of bone marrow erythrocytes were prepared and stained. Micronucleus evaluations were conducted on five animals/group. Two thousand PCEs per animal were scored for the presence of micronuclei. The proportion of PCEs among 1000 total erythrocytes was determined for each animal, and expressed as the PCE/NCE ratio.
Results	Clinical signs were present in the majority of 2000 mg/kg male animals and included eyes partially closed, wet fur, ruffled fur, prostration, abnormal gait, discharge, tremors, and lethargy, indicating that approximately the maximum tolerated dose had

	been achieved. Clinical signs observed in male animals at 1000 mg/kg occurred in a lower incidence of animals and included wet fur, ruffled fur, high carriage, and stained fur/skin. At 500 mg/kg only ruffled fur was observed. Clinical signs were present in the majority of 2000 mg/kg female animals and included eyes partially closed, ruffled fur, prostration, abnormal gait, labored breathing, tremors, and lethargy, indicating that approximately the maximum tolerated dose had been achieved. Clinical signs observed in female animals at 1000 mg/kg occurred in a lower incidence of animals and included wet fur, ruffled fur, abnormal gait, discharge, and lethargy. No clinical signs of toxicity were observed in the 500 mg/kg dose group. There were no test substance-related biologically relevant changes in body weight or body weight gains in either male or female mice administered MCPD Dimer. Mortality occurred at 2000 mg/kg in 1/7 females only. No statistically significant increases in micronucleated PCE frequency were observed in any test substance-treated group when analyzed separately for male or female animals. However, by analyzing the male and female data combined, a statistically significant increase ($p < 0.05$) was observed at 1000 mg/kg (3.8 ± 2.6 MNPCE/2000 PCES) and 2000 mg/kg (6.2 ± 3.4), as compared with the concurrent negative control (1.3 ± 1.5). However, these observed increases are of low potency and in the range of the historical negative control data. Therefore, they, and the apparent dose-response, are considered to be of questionable biological relevance The positive control groups exhibited a statistically significant response consistent with the micronucleated PCE historical control data. Although not statistically significant when analyzed separately for male and female animals, there were depressions in the PCE/NCE ratio in male and female mice treated twice, approximately 24 hours apart, with 2000 mg/kg MCPD Dimer. Mean values for this parameter were decreased approximately 43 and 33% in treated males and females, respectively. In the 1000 mg/kg dose groups, an approximately 27% decrease was observed in treated females only. By analyzing the male and female data combined, a statistically significant decrease ($p < 0.05$) was observed at 1000 mg/kg (0.922 ± 0.384 PCE/NCE Ratio) and 2000 mg/kg (0.732 ± 0.373), as compared with the concurrent negative control (1.194 ± 0.587). Even though these observed decreases are in the range of the historical negative control data, they represent considerable depressions of the PCE/NCE ratio as compared with the concurrent negative control. Therefore, they are indicative of bone marrow toxicity. No statistically significant depressions in the PCE/NCE ratio were found in CP-treated male or female.
Conclusions	The negative and positive controls met the requirements for a valid study. Under the conditions of this study, MCPD Dimer did induce a statistically significant increase in micronucleated polychromatic erythrocytes in mouse bone marrow at 1000 and 2000 mg/kg. However, the observed frequencies are considered to be of questionable biological relevance. Therefore, the test substance was equivocal in this *in vivo* assay.
Data Quality Reliabilities	1. Reliable without restrictions. Guideline study.
References	Donner, M.E., Methylcyclopentadiene Dimer: Mouse Bone Marrow Micronucleus Test, DuPont Haskell Laboratory Report Number DuPont-11371
Other Last changed	June 4, 2004

Methylcyclopentadiene Dimer: Combined Repeated Dose Toxicity Study and Reproductive/Developmental Toxicity Screening Test in Rats

Repeated Dose Toxicity

Test Substance	Methylcyclopentadiene Dimer Concentrate CAS Number 26472-00-4
Remarks	The test substance is a sample of an industrial intermediate stream that is produced by thermal processing and distillation of a pyrolysis gasoline fraction from the ethylene production manufacturing process. The sample tested contained 98.8% MCPD dimers, 2.6% MCPD monomer, 1.6% other C5-C8 monomers, 1.6% CPD-MCPD codimer, 3.0% DCPD and codimers of CPD or MCPD with C4 through C7 monomers, and 0.4% trimers of MCPD and DCPD.
Method	
Method/guideline followed	OECD 422
Test type	Combined repeated dose toxicity study with the reproduction / developmental screening test
GLP	Yes.
Year	2003
Species	Rat
Strain	Crl:CD® (Sprague-Dawley) IGS BR
Route of administration	Gavage
Duration of test	4 Weeks
Doses/concentration levels	0, 20, 100, 300 mg/kg/day
Sex	12 male, 12 female per group.
Exposure period	Not applicable
Frequency of treatment	7 days/week
Control group and treatment	12 male, 12 female, corn oil vehicle.
Post exposure observation period	Not applicable.
Statistical methods	Group means and standard deviations were calculated for all measured parameters. Body weight, weight gain, food consumption, and organ weights were analyzed by Jonckheere-Terpstra trend test. Food efficiency and clinical pathology parameters were analyzed by one-way analysis of variance followed with Dunnett's test. Clinical observations and FOB parameters were analyzed by Cochran-Armitage trend test. Grip strength, foot splay, rearing, and body temperature were analyzed by one-way analysis of variance and Dunnett's test. Motor activity was analyzed by repeated measures analysis of variance with linear contrasts or Jonckheere's trend test.

Test Conditions

Groups of 12 young, adult, male or nulliparous, non pregnant female rats were administered an oral, daily dose of 0, 20, 100, or 300 mg/kg/day of the test substance for approximately 30 days. The study also contained reproductive and developmental toxicity satellite groups (summarized separately).

After approximately 30 days, blood samples were collected from all male rats and all subchronic female rats for measurement of hematology and clinical chemistry parameters. A neurobehavioral test battery, consisting of motor activity and functional observational battery assessments, was conducted on all male rats and subchronic female rats prior to test substance administration in order to obtain baseline measurements. This neurobehavioral test battery was conducted again following approximately 4 weeks of test substance administration. On test days 31 and 32, respectively all subchronic male and female rats underwent gross necropsy. Selected tissues from the control and 300 mg/kg/day groups, and target tissues from all groups were processed for histopathology and examined.

Results

NOAEL (NOEL)

Parameters	NOEL (mg/kg/day)	NOAEL (mg/kg/day)	LOEL (mg/kg/day)
Systemic	Not determined for males; 20 F	Not determined for males; 20 F	20 M 100 F
Pathology	Not determined for males; 20 F	100 M 300 F	20 M 100 F
Neurobehavioral	100 M 300 F	100 M 300 F	300 M

Note: M = Males; F = Females

LOAEL (LOEL)

See table above

Remarks

Clinical Signs of Toxicity and Mortality in Subchronic Males and Females: Increased incidences of salivation, stained fur, and/or wet fur were observed in subchronic males and subchronic females administered 100 or 300 mg/kg/day of the test substance. Lacrimation was also observed in subchronic females administered 300 mg/kg/day of the test substance. Salivation was observed in 20 mg/kg/day males and in 20 mg/kg/day satellite females. Test substance-related mortality did not occur.

Body Weight and Body Weight Gain in Subchronic Males and Females: Test substance-related decreases in body weight and/or weight gain were observed in males and subchronic females administered 300 mg/kg/day of the test substance. On test day 28, body weight of 300 mg/kg/day males and subchronic females was 7.5% and 4% lower than the control values, respectively. Body weight gain over the interval of test days 1-28 for 300 mg/kg/day males and subchronic females was 19% and 16% lower than the control values, respectively. In addition, instances of decreased body weight and/or weight gain were also observed in males and subchronic females administered 100 mg/kg/day of the test substance.

	Food Consumption and Food Efficiency in Subchronic Males and Females: Test substance-related, statistically significant decreases in food consumption and/or food efficiency occurred in 300 mg/kg/day subchronic females. Food consumption of 300 mg/kg/day subchronic females was 9% lower than the control value over the interval of test days 1-28. Transient changes in food consumption and/or food efficiency were also observed in males and/or subchronic females administered 100 or 300 mg/kg/day of the test substance. *Clinical Pathology Parameters*: There were no effects on hematological or clinical chemistry parameters in male or subchronic female rats. *Neurobehavioral Parameters*: Significantly decreased motor activity was observed in 300 mg/kg/day males during the last 20 minutes of the assessment period for the week-4 evaluation. No test substance-related effects were observed in any neurobehavioral parameters in the subchronic females, or in grip strength, foot splay, rearing, body temperature, or in any of the other FOB parameters in males. *Organ Weights and Pathology*: An increase in hyaline droplets in the kidneys was observed in all male rats administered the test substance. Increased hyaline droplets were not observed in females, although 300 mg/kg/day females had a slight increase in kidney weight parameters. The hyaline droplet accumulation in male rats is species and sex specific, and is not predictive of an effect on other species. Hepatocellular hypertrophy, and associated increases in liver weight parameters were observed in 100 and 300 mg/kg/day females and in 300 mg/kg/day males; however, this change may be secondary to enzyme induction as a pharmacological response to a xenobiotic. Minimal to mild thyroid follicular hypertrophy was also observed in 300 mg/kg/day males, which was considered to be test substance-related. Adrenal gland weight parameters in 300 mg/kg/day females were slightly increased, however, this was not associated with morphological changes.
Conclusions	Repeated administration of Methylcyclopentadiene Dimer to male and female Sprague Dawley rats at dosages of 300 mg/kg/day produced effects on clinical signs of toxicity, body weight, food consumption, motor activity, and histopathological changes. In addition, effects on body weight, clinical signs and food consumption were observed at 100 mg/kg/day. Clinical signs of toxicity were observed in males at 20 mg/kg/day. Based on these data, the no-observable-effect level (NOAEL) for systemic toxicity was 20 mg/kg/day in females and was not established in males.
Data Quality Reliabilities	Klimish value = 1 (Reliable without restrictions).
References	Malley, L. A. Methylcyclopentadiene Dimer: Combined Repeated Dose Toxicity Study and Reproductive/Developmental Toxicity Screening Test in Rats. DuPont-11369. Report of E. I. du Pont de Nemours and Company conducted for the American Chemistry Council Olefins Panel.
Other Last changed	26-Jul-04 Robust summary prepared by the contractor for the Olefins Panel

Methylcyclopentadiene Dimer: Combined Repeated Dose Toxicity Study and Reproductive/Developmental Toxicity Screening Test in Rats

Toxicity to Reproduction

Test Substance	Methylcyclopentadiene Dimer Concentrate CAS Number 26472-00-4
Remarks	The test substance is a sample of an industrial intermediate stream that is produced by thermal processing and distillation of a pyrolysis gasoline fraction from the ethylene production manufacturing process. The sample tested contained 98.8% MCPD dimers, 2.6% MCPD monomer, 1.6% other C5-C8 monomers, 1.6% CPD-MCPD codimer, 3.0% DCPD and codimers of CPD or MCPD with C4 through C7 monomers, and 0.4% trimers of MCPD and DCPD.
Method	
Method/guideline followed	OECD 422
Test type	Combined repeated exposure toxicity study with the reproduction/developmental screening test
GLP	Yes.
Year	2003
Species	Rat
Strain	Crl:CD® (Sprague-Dawley) IGS BR
Route of administration	Gavage.
Duration of test	Satellite groups of 12 young, nulliparous, nonpregnant female rats were administered an oral, daily dose of the test substance during a premating period of approximately 2 weeks, a cohabitation period of approximately 2 weeks, a gestation period of approximately 3 weeks, and a lactation period of approximately 4 days. The males were exposed for 31 days.
Doses/concentration levels	0, 20, 100, or 300 mg/kg/day. Due to an error during approximately gestation days 7-14, satellite females received dosages based on their gestation day 0 or cohabitation day 0 body weights instead of gestation 7 or gestation day 14 body weights.
Sex	12 male, 12 female per group.
Exposure period	Not applicable
Frequency of treatment	7 days/week
Control group and treatment	12 male, 12 female, corn oil vehicle.
Post exposure observation period	Not applicable.
Statistical methods	Group means and standard deviations were calculated for all measured parameters. Body weight, weight gain, food consumption, and organ weights were analyzed by Jonckheere-Terpstra trend test. Food efficiency was analyzed by one-way analysis of variance followed with Dunnett's test. Clinical observations, mating index, fertility index, and gestation index were analyzed by Cochran-Armitage trend test. Gestation length, implantation site numbers, implantation efficiency, mean number of pups per litter, percent of pups born alive, day 0-4 viability of

pups, viability index, number of *corpora lutea*, sex ratio, pre-implantation loss, and post-implantation loss were analyzed by Jonckheere-Terpstra trend test.

Mean pup weights were analyzed by linear contrast of the least square means.

Test Conditions

Satellite groups of 12 young, nulliparous, female rats were administered an oral, daily dose of 0, 20, 100, or 300 mg/kg/day during a premating period of approximately 2 weeks, a cohabitation period of approximately 2 weeks, a gestation period of approximately 3 weeks, and a lactation period of approximately 4 days. Due to an error during approximately gestation days 7-14, satellite females received dosages based on their gestation day 0 or cohabitation day 0 body weights instead of gestation 7 or gestation day 14 body weights. Following the 2-week premating period, each satellite female was paired with a male of the same respective dosage group during a 2-week cohabitation period. Measurements of body weight, food consumption, and clinical signs of toxicity in females were conducted throughout premating, cohabitation, gestation, and lactation. After postpartum day 4, lactating females and nonpregnant females were sacrificed, selected organs were weighed, and selected tissues were evaluated microscopically. Offspring were evaluated for external abnormalities, and sacrificed on postnatal day 4. The study design included a main study for repeated dose toxicity end points (summarized separately).

The males were exposed for a total of 31 days, and were then necropsied. In addition to the repeated dose toxicity end points assessed (discussed separately), reproductive assessment of the males included mating, conception and fertility indices, reproductive organ weights and gross/histopathology of the reproductive tract.

Results

NOAEL (NOEL)

Parameters	NOEL (mg/kg/day)	NOAEL (mg/kg/day)	LOEL (mg/kg/day)
Systemic	Not determined for males; 20 F	Not determined for males; 20 F	20 M 100 F
Reproductive (M/F)	300	300	-

LOAEL (LOEL)

Not applicable.

Remarks

Clinical signs and mortality: Increased incidences of salivation, stained fur, and/or wet fur were observed in males and satellite females administered 100 or 300 mg/kg/day. Salivation was observed in 20 mg/kg/day males and satellite females.

Body Weight and Body Weight Gain in Subchronic Males and Satellite Females: Test substance-related decreases in body weight and/or weight gain were observed in males and satellite females administered 300 mg/kg/day of the test substance. On test day 28, body weight of 300 mg/kg/day males was 7.5% lower than the control values. Body weight gain over the interval of test days 1-28 for 300 mg/kg/day males was 19% lower than the control value. In addition, instances of decreased body weight and/or weight gain were also observed in males administered 100 mg/kg/day of the test substance.

There were no test substance-related effects on body weight or weight gain

	of 300 mg/kg/day satellite females during the premating period. However, at the end of the gestation period (day 21), body weight of 300 mg/kg/day satellite females was 5% lower than the control value; and for the interval of gestation days 0-21, weight gain of 300 mg/kg/day satellite females was13% lower than the control values. There were no effects on body weight or weight gain at any dosage in satellite females during the lactation period. *Food Consumption and Food Efficiency in Subchronic Males and Satellite Females*: Test substance-related, statistically significant decreases in food consumption and/or food efficiency occurred in 300 mg/kg/day in satellite females during gestation. Food consumption and food efficiency were decreased 7.5% and 7.3%, respectively, in 300 mg/kg/day satellite females during gestation days 0-21. Transient changes in food consumption and/or food efficiency were also observed in males administered 100 or 300 mg/kg/day of the test substance. *Reproductive Indices*: No test substance-related effects or statistically significant differences in mating index, fertility index, gestation length number of implantation sites, implantation efficiency, pre-implantation loss, post-implantation loss, or number of *corpora lutea* were observed for any dosage of the test substance in satellite females. *Offspring Parameters*: No effects were observed at any dosage for the number of pups born, number of pups born alive, sex ratio, gestation index, or litter survival for postnatal days 0-4 in the offspring from any dosage group. *Reproductive Pathology*: There were no test substance-related effects on morphology of the reproductive tract in either males or females.
Conclusions	Repeated administration of Methylcyclopentadiene Dimer to male and female Sprague Dawley rats at dosages of 0, 20, 100, or 300 mg/kg/day produced no evidence of adverse effects on any measures of reproductive function. Based on these data, the no-observable-effect level (NOEL) for reproductive toxicity was 300 mg/kg/day.
Data Quality Reliabilities	Klimish value = 1 (Reliable without restrictions).
References	Malley, L. A. Methylcyclopentadiene Dimer: Combined Repeated Dose Toxicity Study and Reproductive/Developmental Toxicity Screening Test in Rats. DuPont-11369. Report of E. I. du Pont de Nemours and Company conducted for the American Chemistry Council Olefins Panel.
Other Last changed	26-Jul-04 Robust summary prepared by the contractor for the Olefins Panel

Methylcyclopentadiene Dimer: Combined Repeated Dose Toxicity Study and Reproductive/Developmental Toxicity Screening Test in Rats

Developmental Toxicity/Teratogenicity

Test Substance	Methylcyclopentadiene Dimer Concentrate CAS Number 26472-00-4
Remarks	The test substance is a sample of an industrial intermediate stream that is produced by thermal processing and distillation of a pyrolysis gasoline fraction from the ethylene production manufacturing process. The sample tested contained 98.8% MCPD dimers, 2.6% MCPD monomer, 1.6% other C5-C8 monomers, 1.6% CPD-MCPD codimer, 3.0% DCPD and codimers of CPD or MCPD with C4 through C7 monomers, and 0.4% trimers of MCPD and DCPD.
Method	
Method/guideline followed	OECD 422
Test type	Combined repeated exposure inhalation toxicity study with the reproduction / developmental screening test
GLP	Yes.
Year	2003
Species	Rat
Strain	Crl:CD® (Sprague-Dawley) IGS BR
Route of administration	Oral gavage.
Duration of test	Satellite groups of 12 young, nulliparous, female rats were administered an oral, daily dose of the test substance during a premating period of approximately 2 weeks, a cohabitation period of approximately 2 weeks, a gestation period of approximately 3 weeks, and a lactation period of approximately 4 days. The males were exposed for 31 days.
Doses/concentration levels	0, 20 100, or 300 mg/kg/day
Sex	12 male, 12 female per group.
Exposure period	Not applicable
Frequency of treatment	7 days/week
Control group and treatment	12 male, 12 female, corn oil vehicle.
Post exposure observation period	Not applicable.
Statistical methods	Group means and standard deviations were calculated for all measured parameters. Body weight, weight gain, food consumption, and organ weights were analyzed by Jonckheere-Terpstra trend test. Food efficiency was analyzed by one-way analysis of variance followed with Dunnett's test. Clinical observations, mating index, fertility index, and gestation index were analyzed by Cochran-Armitage trend test. Gestation length, implantation site numbers, implantation efficiency, mean number of pups per litter, percent of pups born alive, day 0-4 viability of pups, viability index, number of *corpora lutea*, sex ratio, pre-implantation loss, and post-implantation loss were analyzed by Jonckheere-Terpstra

trend test.

Mean pup weights were analyzed by linear contrast of the least square means.

Test Conditions

Satellite groups of 12 young, nulliparous, female rats were administered an oral, daily dose of 0, 20, 100, or 300 mg/kg/day during a premating period of approximately 2 weeks, a cohabitation period of approximately 2 weeks, a gestation period of approximately 3 weeks, and a lactation period of approximately 4 days. Due to an error during approximately gestation days 7-14, satellite females received dosages based on their gestation day 0 or cohabitation day 0 body weights instead of gestation 7 or gestation day 14 body weights. Following the 2-week premating period, each satellite female was paired with a male of the same respective dosage group during a 2- week cohabitation period. Measurements of body weight, food consumption, and clinical signs of toxicity in females were conducted throughout premating, cohabitation, gestation, and lactation. After postpartum day 4, lactating females and nonpregnant females were sacrificed, selected organs were weighed, and selected tissues were evaluated microscopically. Offspring were evaluated for external abnormalities, and sacrificed on postnatal day 4. The study design included a main study for repeated dose toxicity end points (summarized separately).

The males were exposed for a total of 31 days, and were then necropsied. In addition to the repeated dose toxicity end points assessed (discussed separately), reproductive assessment of the males included mating, conception and fertility indices, reproductive organ weights and gross/histopathology of the reproductive tract.

Results

NOAEL (NOEL)

Parameters	NOEL (mg/kg/day)	NOAEL (mg/kg/day)	LOEL (mg/kg/day)
Developmental (pups)	20	20	100

Note: M = Males; F = Females

LOAEL (LOEL)

Not applicable.

Remarks

Clinical signs and mortality: Increased incidences of salivation, stained fur, and/or wet fur were observed in satellite females administered 100 or 300 mg/kg/day MCPD. Salivation was also observed in 20 mg/kg/day satellite females.

Body Weight and Weight Gain for Satellite Females: There were no test substance-related effects on body weight or weight gain of 300 mg/kg/day satellite females during the premating period. However, at the end of the gestation period (day 21), body weight of 300 mg/kg/day satellite females was 5% lower than the control value; and for the interval of gestation days 0-21, weight gain of 300 mg/kg/day satellite females was13% lower than the control values. There were no effects on body weight or weight gain at any dosage in satellite females during the lactation period.

Food Consumption and Food Efficiency for Satellite Females: Test substance-related, statistically significant decreases in food consumption and/or food efficiency occurred in 300 mg/kg/day in satellite females during gestation. Food consumption and food efficiency were decreased 7.5% and 7.3%, respectively, in 300 mg/kg/day satellite females during gestation days 0-21.

	Offspring Parameters: Decreased mean pup weight was observed in offspring from the 100 and 300 mg/kg/day groups. No effects were observed at any dosage for the number of pups born, number of pups born alive, sex ratio, gestation index, external abnormalities, or litter survival for postnatal days 0-4 in the offspring from any dosage group.
Conclusions	Repeated administration of Methylcyclopentadiene Dimer to male and female Sprague Dawley rats at dosages of 0, 20, 100, or 300 mg/kg/day produced no evidence of teratogenicity, however, pups from the 100 and 300 mg/kg/day groups had decreased body weight. Based on these data, the no-observable-effect level (NOEL) for developmental toxicity in pups was 20 mg/kg/day.
Data Quality	
Reliabilities	Klimish value = 1 (Reliable without restrictions).
References	Malley, L. A. Methylcyclopentadiene Dimer: Combined Repeated Dose Toxicity Study and Reproductive/Developmental Toxicity Screening Test in Rats. DuPont-11369. Report of E. I. du Pont de Nemours and Company conducted for the American Chemistry Council Olefins Panel.
Other	
Last changed	26-Jul-04 Robust summary prepared by the contractor for the Olefins Panel

Partition Coefficient

Test Substance:	CAS No.: **68478-10-4 Dicyclopentadiene/Codimer Concentrate.** This stream is produced as a distillate from a C8+ fraction of thermally processed pyrolysis gasoline obtained from ethylene production (steam cracking process). The sample tested consisted of dicyclopentadiene (29%), methylcyclopentadiene dimer (13%), cyclopentadiene/methylcyclopentadiene codimer (13%), other codimers of cyclopentadiene – e.g. with 1,3-butadiene or isoprene (7%), other similar codimers of methylcyclopentadiene (22%), balance (16%). *Note: the above composition percentages were reported by the supplier of the test substance on December 17, 2002.*
Method/Guideline:	EEC A8 / OECD 117
Year (guideline):	1993 / 1989
Type (test type):	N-Octanol/Water Partition Coefficient (HPLC method)
GLP:	Yes
Year (study performed):	2003
Temperature:	25 Deg C
Log P_{ow} Value:	3.2 - 5.9
Test Conditions:	
• **Note: Concentration prep., vessel type, replication, test conditions.**	Test substance was evaluated at a concentration of 254 mg/L prepared in HPLC mobile phase (3:1 methanol:water). HPLC analysis was performed on a Hewlett Packard 1050 Liquid Chromatograph with an Inertsil 5um C8 (15cm x 4.6mm id) column with a 1 mL/min flow rate, 10uL injection volume and UV detection at 210 nm. Six reference compounds (with known log P_{ow} values), each at approximately 50 mg/L , were analyzed in a combined solution including nitrobenzene (log P_{ow} =1.9), ethylbenzoate (log P_{ow} = 2.6), bromobenzene (log P_{ow}=3.0), benzylbenzoate (log P_{ow}=4.0), triphenylamine (log P_{ow}=5.7) and DDT (log P_{ow}=6.2). Additionally, an unretained standard of 4,5-dihydroxynaphthalene-2,7-disulphonic acid, disodium salt was analyzed to determine the system deadtime. Two sets of reference mixture and test substance runs were performed.
Results:	
Units/Value:	Multiple components detected with Log P_{ow} values between 3.2 and 5.9 (calculated from the mean exponential regression of reference compounds).

Reliability:	(1) Reliable without restriction
Reference:	Huntingdon Life Sciences, Ltd. 2003, Physicochemical Properties Study EXN043/032972.
Other (source):	Olefins Panel, American Chemistry Council

Vapor Pressure

Test Substance:	CAS No. : **68478-10-4 Dicyclopentadiene/Codimer Concentrate** This stream is produced as a distillate from a C8+ fraction of thermally processed pyrolysis gasoline obtained from ethylene production (steam cracking process). The sample tested consisted of dicyclopentadiene (29%), methylcyclopentadiene dimer (13%), cyclopentadiene/methylcyclopentadiene codimer (13%), other codimers of cyclopentadiene – e.g. with 1,3-butadiene or isoprene (7%), other similar codimers of methylcyclopentadiene (22%), balance (16%). *Note: the above composition percentages were reported by the supplier of the test substance on December 17, 2002.*
Method/Guideline:	EEC A4 / OECD 104
Year (guideline):	1993 / 1995
Type (test type):	Vapor Pressure (static measurement procedure)
GLP:	Yes
Year (study performed):	2003
Temperature:	25 Deg C
Vapor Pressure Value:	800 Pa
Test Conditions: • **Note: Concentration prep., vessel type, replication, test conditions.**	Test conducted at five temperatures between 303 and 323 Deg K (30 and 50 Deg C). Actual test temperatures were 303.15, 308.15, 313.15, 318.15 and 323.15. Duplicate measurements made at each temperature.
Results: **Units/Value:**	Mean vapor pressures were as follows: 1100 Pa at 303.15 Deg K 1800 Pa at 308.15 Deg K 2500 Pa at 313.15 Deg K 3600 Pa at 318.15 Deg K 4900 Pa at 323.15 Deg K 800 Pa at 25 Deg C (calculated from linear regression)
Reliability:	(1) Reliable without restriction
Reference:	Huntingdon Life Sciences, Ltd. 2003, Physicochemical Properties Study EXN043/032972.

Other (source): Olefins Panel, American Chemistry Council

Dicyclopentadiene/Codimer Concentrate: Combined Repeated Dose Toxicity Study and Reproductive/Developmental Toxicity Screening Test in Rats

Repeated Dose Toxicity

Test Substance	Dicyclopentadiene/Codimer Concentrate CAS Number 68478-10-4
Remarks	Dicyclopentadiene/Codimer (DCPD/Codimer Concentrate), CAS# 68478-10-4; stable at room temperature below 70° F; colorless liquid DCPD/Codimer Concentrate is produced as a distillate from a C8+ fraction of thermally processed pyrolysis gasoline obtained from ethylene production (steam cracking process). The sample tested consisted of dicyclopentadiene (29%), methylcyclopentadiene dimer (13%), cyclopentadiene/methylcyclopentadiene codimer (13%), other codimers of cyclopentadiene - e.g. with 1,3-butadiene or isoprene (7%), other similar codimers of methylcyclopentadiene (22%), balance (16%). Note: the above composition percentages were reported by the supplier of the test substance on December 17, 2002.
Method	
Method/guideline followed	OECD 422
Test type	Combined repeated dose toxicity study with the reproduction / developmental screening test
GLP	Yes.
Year	2003
Species	Rat
Strain	Crl:CD® (Sprague-Dawley) IGS BR
Route of administration	Gavage
Duration of test	4 Weeks
Doses/concentration levels	0, 5, 25, 100 mg/kg/day
Sex	12 male, 12 female per group.
Exposure period	Not applicable
Frequency of treatment	7 days/week
Control group and treatment	12 male, 12 female, corn oil vehicle.
Post exposure observation period	Not applicable.
Statistical methods	Group means and standard deviations were calculated for all measured parameters. Body weight, weight gain, food consumption, and organ weights were analyzed by Jonckheere-Terpstra trend test. Food efficiency and clinical pathology parameters were analyzed by one-way analysis of variance followed with Dunnett's test. Clinical observations and FOB parameters were analyzed by Cochran-Armitage trend test.

	Grip strength, foot splay, rearing, body temperature, and motor activity were analyzed by repeated measures analysis of variance with linear contrasts or Jonckheere’s trend test.

Test Conditions	Groups of 12 young, adult, male or nulliparous female rats were administered an oral daily dose of 0, 5, 25, or 100 mg/kg/day DCPD Codimer for approximately 30 days. The study also contained reproductive and developmental toxicity satellite groups (summarized separately). After approximately 30 days, blood samples were collected from all male rats and all subchronic female rats for measurement of hematology and clinical chemistry parameters. A neurobehavioral test battery, consisting of motor activity and functional observational battery assessments, was conducted on all male rats and subchronic female rats prior to test substance administration in order to obtain baseline measurements. This neurobehavioral test battery was conducted again following approximately 4 weeks of test substance administration. On test days 30 and 31, respectively all subchronic male and female rats underwent gross necropsy. Selected tissues from the control and 100 mg/kg/day groups, and target tissues from all groups were processed for histopathology and examined.
Results NOAEL (NOEL)	<table><tr><th>Parameters</th><th>NOEL (mg/kg/d)</th><th>NOAEL (mg/kg/d)</th><th>LOEL (mg/kg/d)</th></tr><tr><td>Systemic</td><td>ND[a] M 5 F</td><td>5 M 5 F</td><td>5 M 25 F</td></tr><tr><td>Reproductive (M/F)</td><td>100</td><td>100</td><td>-</td></tr><tr><td>Developmental (pups)</td><td>100</td><td>100</td><td>-</td></tr><tr><td>Neurobehavioral</td><td>100 M/F</td><td>100 M/F</td><td>-</td></tr></table> a ND denotes not determined. M=males; F=females A NOEL was not determind for males based on increased incidence of renal tubular hyaline droplets at all dosages, and, therefore, the LOEL level was 5 mg/kg/day, the lowest dosage tested. However, since this lesion is not considered to be relevant in humans, the NOAEL for males was 5 mg/kg/day. The NOEL and NOAEL in females was 5 mg/kg/day based on thyroid follicular cell hypertrophy at 25 mg/kg/day. The LOEL in females was, therefore, 25 mg/kg/day.
LOAEL (LOEL)	See table above
Remarks	*Clinical Signs of Toxicity and Mortality in Subchronic Males and Females*: There were no test substance-related effects on predosing, postdosing, or detailed clinical observations in

	males, subchronic females, or satellite females administered any dosage of the test substance. Test substance-related mortality did not occur. *Body Weight and Body Weight Gain in Subchronic Males and Females*: Decreased weight gain was observed in 25 and 100 mg/kg/day subchronic females. However, since body weight was only 3% and 4% lower than the control values on test day 29 in the 25 and 100 mg/kg/day subchronic females, respectively, and since there were no effects on body weight gain in satellite females, the decreased body weight gain was not considered to be biologically adverse. There were no effects on body weight or weight gain in males. *Food Consumption and Food Efficiency in Subchronic Males and Females*: There were no test substance-related or statistically significant effects on food consumption or food efficiency in males or subchronic females administered any dosage of the test substance. *Clinical Pathology Parameters*: There were no effects on hematological or clinical chemistry parameters in male or subchronic female rats. Administration of 100 mg/kg/day of the test substance for approximately 30 days resulted in decreased serum bilirubin concentration. However, decreased serum bilirubin concentration was considered to be secondary to enzyme induction as a pharmacological response to a xenobiotic and was not considered to be adverse. *Neurobehavioral Parameters*: No test substance-related effects were observed in motor activity, any neurobehavioral parameters in the FOB, or in grip strength, foot splay, rearing, or body temperature, in males or subchronic females. *Pathology*: Administration of 5, 25, or 100 mg/kg/day of the test substance for approximately 30 days produced a dose-related increase in renal tubular hyaline droplets in male rats which was correlated with an increase in the incidence of bilateral pale kidney discoloration, and changes in kidney weight parameters. However, hyaline droplet nephropathy was not observed in males, and increased hyaline droplets were not observed in females. The hyaline droplet accumulation in male rats was not considered to be an adverse effect of the test substance, since it is species and sex specific, and is not predictive of an effect on other species.

	Hepatocellular hypertrophy, and associated increases in liver weight parameters were observed in 100 mg/kg/day males, and subchronic females. One subchronic female in the 25 mg/kg/day group also had hepatocellular hypertrophy. However, this change is considered to be secondary to enzyme induction as a pharmacological response to a xenobiotic, and was not considered to be adverse. Minimal thyroid follicular cell hypertrophy was observed in 25 and 100 mg/kg/day males and subchronic females, which was considered to be test substance-related and potentially adverse.
Conclusions	Repeated administration of Dicyclopentadiene/Codimer Concentrate in male and female Sprague Dawley rats at dosages of 25 or 100 mg/kg/day produced minimal morphological changes in the thyroid of male and subchronic females rats. Based on these data, the no-observable-adverse-effect level (NOAEL) for systemic toxicity was 5 mg/kg/day in males and females.
Data Quality Reliabilities	Klimish value = 1 (Reliable without restrictions).
References	Malley, L. A. Dicyclopentadiene/Codimer Concentrate: Combined Repeated Dose Toxicity Study and Reproductive/Developmental Toxicity Screening Test in Rats. DuPont-12690. Report of E. I. du Pont de Nemours and Company conducted for the American Chemistry Council Olefins Panel.
Other Last changed	August, 27, 2004 Robust summary prepared by contract for the Olefins Panel

Dicyclopentadiene/Codimer Concentrate: Combined Repeated Dose Toxicity Study and Reproductive/Developmental Toxicity Screening Test in Rats

Toxicity to Reproduction

Test Substance	Dicyclopentadiene/Codimer Concentrate CAS Number 68478-10-4
Remarks	Dicyclopentadiene/Codimer (DCPD/Codimer Concentrate), CAS# 68478-10-4; stable at room temperature below 70° F; colorless liquid DCPD/Codimer Concentrate is produced as a distillate from a C8+ fraction of thermally processed pyrolysis gasoline obtained from ethylene production (steam cracking process). The sample tested consisted of dicyclopentadiene (29%), methylcyclopentadiene dimer (13%), cyclopentadiene/methylcyclopentadiene codimer (13%), other codimers of cyclopentadiene - e.g. with 1,3-butadiene or isoprene (7%), other similar codimers of methylcyclopentadiene (22%), balance (16%). Note: the above composition percentages were reported by the supplier of the test substance on December 17, 2002.
Method	
Method/guideline followed	OECD 422
Test type	Combined repeated exposure toxicity study with the reproduction / developmental screening test
GLP	Yes.
Year	2003
Species	Rat
Strain	Crl:CD® (Sprague-Dawley) IGS BR
Route of administration	Gavage.
Duration of test	Satellite groups of 12 young, nulliparous, female rats were administered an oral daily dose of the test substance during a premating period of approximately 2 weeks, a cohabitation period of approximately 2 weeks, a gestation period of approximately 3 weeks, and a lactation period of approximately 3 days. The young adult males were exposed for 29 days.
Doses/concentration levels	0, 5, 25, or 100 mg/kg/day.
Sex	12 male, 12 female per group.
Exposure period	Not applicable
Frequency of treatment	7 days/week
Control group and treatment	12 male, 12 female, corn oil vehicle.
Post exposure observation period	Not applicable.
Statistical methods	Group means and standard deviations were calculated for all measured parameters. Body weight, weight gain, food

	consumption, and organ weights were analyzed by Jonckheere-Terpstra trend test. Food efficiency was analyzed by one-way analysis of variance followed with Dunnett's test. Clinical observations, mating index, fertility index, and gestation index were analyzed by Cochran-Armitage trend test. Gestation length, implantation site numbers, implantation efficiency, mean number of pups per litter, percent of pups born alive, day 0-4 viability of pups, viability index, number of *corpora lutea*, sex ratio, pre-implantation loss, and post-implantation loss were analyzed by Jonckheere-Terpstra trend test. Mean pup weights were analyzed by linear contrast of the least square means.
Test Conditions	Satellite groups of 12 young, nulliparous, nonpregnant female rats were administered an oral, daily dose of 0, 5, 25, or 100 mg/kg/day during a premating period of approximately 2 weeks, a cohabitation period of approximately 2 weeks, a gestation period of approximately 3 weeks, and a lactation period of approximately 3 days. Following the 2-week premating period, each satellite female was paired with a male of the same respective dosage group during a 2-week cohabitation period. Measurements of body weight and clinical signs of toxicity in females were conducted throughout premating, cohabitation, gestation, and lactation. Food consumption was recorded weekly during premating for males and satellite females, and during getation and laction for the satellite females. On postpartum day 4, lactating females and nonpregnant females were sacrificed, selected organs were weighed, and selected tissues were evaluated microscopically. Offspring were evaluated for external abnormalities, and sacrificed on postnatal day 4. The study design included a main study for repeated dose toxicity endpoints (summarized separately). The males were exposed for a total of 29 days, and were then necropsied. In addition to the repeated dose toxicity endpoints assessed (discussed separately), reproductive assessment of the males included mating, conception and fertility indices, reproductive organ weights and gross/histopathology of the reproductive tract.
Results NOAEL (NOEL)	100 mg/kg/day for parental animals 100 mg/kg/day for pups.
LOAEL (LOEL)	Not applicable.
Remarks	*Clinical signs and mortality*: There were no test substance-related effects on predosing or postdosing clinical observations

	in subchronic males or satellite females administered any dosage of the test substance. Test substance-related mortality did not occur. *Body weight and weight gain*: There were no effects on body weight gain in subchronic males or satellite females. *Food Consumption and Food Efficiency*: There were no test substance-related or statistically significant effects on food consumption or food efficiency in males or satellite females administered any dosage of the test substance. *Reproductive Indices*: No test substance-related effects or statistically significant differences in mating index, fertility index, gestation length, number of implantation sites, implantation efficiency, pre-implantation loss, post-implantation loss, or number of *corpora lutea* were observed for any dosage of the test substance in satellite females. *Offspring Parameters*: There were no test substance-related effects on mean pup weight, number of pups born, number of pups born alive, sex ratio, gestation index, external abnormalities, or litter survival for postnatal days 0-4 in the offspring from any dosage group. *Reproductive Pathology*: There were no test substance-related effects on morphology of the reproductive tract in either males or females.
Conclusions	Repeated administration of Dicyclopentadiene/Codimer Concentrate to male and female Sprague Dawley rats throughout premating, mating, gestation and lactation at dosages of 0, 5, 25, or 100 mg/kg/day produced no evidence of adverse effects on any measures of reproductive function or offspring development. Based on these data, the no-observable-effect level (NOEL) for reproductive toxicity was 100 mg/kg/day in parental animals and 100 mg/kg/day in pups.
Data Quality Reliabilities	Klimish value = 1 (Reliable without restrictions).
References	Malley, L. A. Dicyclopentadiene/Codimer Concentrate: Combined Repeated Dose Toxicity Study and Reproductive/Developmental Toxicity Screening Test in Rats. DuPont-12690. Report of E. I. du Pont de Nemours and Company conducted for the American Chemistry Council Olefins Panel.
Other	

Last changed	August 31, 2004 Robust summary prepared by contractor for the Olefins Panel

Robust Summary
Alga Toxicity

Test Substance:	CAS No.: 26472-00-4, Methylcyclopentadiene Dimer Concentrate (MCPD Dimer Concentrate). The test substance contained 90.8% MCPD Dimer, 2.6% MCPD and 1.6% Cyclopentadiene (CPD)-MCPD codimer. The balance of the stream consisted of other hydrocarbons, primarily C4-C7 codimers of MCPD or CPD. CAS Inventory Name: 4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydrodimethyl-
Method/Guideline:	OECD Guideline 201
Year (guideline):	1984
Type (test type):	Alga Toxicity Test
GLP (Y/N):	Yes
Year (study performed):	2003
Species:	*Pseudokirchneriella subcapitata*
Analytical Monitoring:	Yes
Exposure Period:	96 hours
Statistical Method:	The E_bC_{50}, E_rC_{50} and confidence intervals for inhibition of growth/growth rate slope were determined by a probit regression calculation of the probit of the growth inhibition/growth rate slope vs the log of the concentration and associated confidence intervals based on the methods of Finney (1971). Calculations were based on the PROC PROBIT procedure of SAS (2002). The NOEC for the E_bC_{50} and E_rC_{50} was based on Duncan's (1975) Multiple Range test and Dunnett's (1964) test, determined from the GLM procedure of SAS (2002). The Shapiro-Wilk (1965) test for normality was used to test if the assumption of normality of the residuals was met; since the residuals were normally distributed the NOEC was based on the estimated values. Finney, D.J. 1971. *Probit Analysis*, 3rd Edition, London: Cambridge University Press. SAS Version 8, SAS Institute, Inc., Cary, NC. 2002. Duncan, D.B. 1975, "t-Tests and Intervals for Comparisons Suggested by the Data", Biometrics, 31, 339-359. Dunnett, C. 1964, "New Tables for Multiple Comparisons With A Control", Biometrics, Vol 20, No. 3, pg 482-491. Shapiro, S.S. and Wilk, M.B. 1965,"n analysis of variance test for normality (complete samples)" Biometrika, 52, pg 591-611.
Test Conditions: • **Note: Concentration preparation, vessel type, volume, replication, environmental conditions, organisms supplier, loading, deviations from guideline or protocol.**	Individual Water Accommodated Fractions (WAF's) were prepared for each treatment. The test substance was added to 20.7L of algal nutrient medium augmented with sodium bicarbonate in glass aspirator bottles (capacity 22 L). The solutions were mixed for approximately 23 hours using an 8% vortex (of the static liquid depth). The test solutions were removed through the outlet at the bottom of each mixing vessel into 12 replicates of 140 mL in 125 mL Erlenmeyer flasks (no headspace) containing two 14mm glass spheres to facilitate mixing. The test chambers were inoculated with algae (1.0×10^4 cells/mL) and were sealed with ground glass stoppers. Three replicates were sacrificed daily

	for cell density determination. The test chambers were placed on shaker tables (100 rpm) to keep the algae in suspension. The test was performed under static conditions with no aeration. The algae was cultured in-house from 5 day old stock cultures in log phase growth. Mean test temperature: 23.4°C (sd = 0.2). Continuous light: intensity was 8440 to 8636 Lux. The pH was 7.6 in all of the test solutions at test initiation and ranged from 8.8 to 10.1 at test termination. Due to the relatively complex nature and limited water solubility of the test substance, the following exceptions to the guideline apply for this study: The concentration of the test substance in solution was not determined prior to use. Test substance analysis was performed on samples of the WAFs at the start of the test (day 0) and at termination (day 4). The initial concentration of the test substance was not maintained at 80% throughout the test (this may be due to biological activity or physical processes in the test chambers). It was deemed more appropriate to prepare individual treatment solutions by adding the test substance to dilution water and removing the WAF of each mixture for testing than to prepare dilutions of a stock solution. The test duration was 96 hours, instead of 72 hours. However, both 72 and 96-hour endpoints were determined. None of the above exceptions are believed to have affected the outcome, integrity, or quality of the study.
Results: **Units/Value:** **Note: Analytical method, biological observations, control survival.**	Effects on growth rate (r) based upon actual loading rates: 72 hr ErL50 (loading rate) = 1.2* mg/L (1.0 - 1.6 mg/L) 96 hr ErL50 (loading rate) = 1.2* mg/L (1.1 - 1.3 mg/L) 72 & 96 hr NOELR (loading rate) = 0.17 mg/L Effects on biomass (b) based upon actual loading rates: 72 hr EbL50 (loading rate) = 0.64 mg/L (0.46 - 0.92 mg/L) 96 hr EbL50 (loading rate) = 0.65 mg/L (0.47 - 0.93 mg/L) 72 & 96 hr NOELR (loading rate) = 0.17 mg/L Effects on growth rate (r) based upon measured concentrations: 72 hr ErC50 (measured conc.) = 0.82** mg/L (0.63 - 1.3 mg/L) 96 hr ErC50 (measured conc.) = 0.83** mg/L (0.71 - 1.1 mg/L) 72 & 96 hr NOEC (measured conc.) = 0.096 mg/L Effects on biomass (b) based upon measured concentrations: 72 hr EbC50 (measured conc.) = 0.42 mg/L (0.23 - 0.91** mg/L) 96 hr EbC50 (measured conc.) = 0.42 mg/L (0.25 - 0.86** mg/L) 72 & 96 hr NOEC (measured conc.) = 0.096 mg/L Values in parenthesis are 95% confidence intervals. * Values are extrapolated, the maximum actual loading rate was 1.1 mg/L. ** Values are extrapolated, the maximum measured concentration was 0.76 mg/L. The analytical method used was headspace gas chromatography with flame ionization detection. Summary of In-Life observations - % Inhibition

Loading Rate (mg/L)	Control	0.019	0.068	0.17	0.51	1.1
Meas. Conc. (mg/L)	0	0.029	0.048	0.096	0.28	0.76
Based on Growth Rate						
72 hours	n/a	1.5	2.0	1.6	17	42
96 hours	n/a	0.8	1.4	0.0	12	41
Based on Biomass						
72 hours	n/a	4.4	5.0	6.0	50	85
96 hours	n/a	3.9	4.1	1.7	46	87

Conclusion:	Effects on growth rate (r) based upon actual loading rates: 72 and 96 hr ErL50 = 1.2 mg/L Effects on biomass (b) based upon actual loading rates: 72 hr EbL50 = 0.64 mg/L 96 hr EbL50 = 0.65 mg/L Effects on growth rate (r) based upon measured concentrations: 72 hr ErC50 = 0.82 mg/L 96 hr ErC50 = 0.83 mg/L Effects on biomass (b) based upon measured concentrations: 72 and 96 hr EbC50 = 0.42 mg/L
Reliability:	(1)-Reliable without restriction
Reference:	ExxonMobil Biomedical Sciences, Inc. 2003. Alga, Growth Inhibition Test on Methylcyclopentadiene Dimer Concentrate. Study # 154567A.
Other (source):	Olefins Panel, American Chemistry Council

Robust Summary
Invertebrate Acute Toxicity

Test Substance:	Low Dicyclopentadiene Resin Oil (Low DCPD Resin Oil) CAS No. 68477-54-3. Distillates, petroleum, steam-cracked, C8-12 fraction. This stream can also be described by CAS No. 68516-20-1. Naphtha, petroleum, steam-cracked middle arom. . Low DCPD Resin Oil is a C8 to C10 distillate obtained from a pyrolysis gasoline stream produced by an ethylene production process (steam cracking process). The sample tested consisted of vinyltoluenes (17%), trimethylbenzenes (9%), styrene and methylstyrenes (3%), indene (14%), methylindene (8%), and naphthalene (1%). The balance of the composition is expected to consist of other hydrocarbons with carbon range primarily 8 to 10, mainly aromatics and olefins, with some paraffins.
Method/Guideline:	OECD Guideline 202
Year (guideline):	1984
Type (test type):	Daphnid Acute Toxicity Test
GLP (Y/N):	Yes
Year (study performed):	2003
Species:	*Daphnia magna* Straus
Analytical Monitoring:	Yes
Exposure Period:	48 hours
Statistical Method:	The 48 hour EL_{50} and EC_{50} values were determined using a maximum likelihood analysis based on D. J. Finney (1971). Finney, D.J., 1971. Probit Analysis, 3rd Edition, London: Cambridge University Press.
Test Conditions: • **Note: Concentration preparation, vessel type, volume, replication, environmental conditions, organisms supplier, loading, deviations from guideline or protocol.**	Individual Water Accommodated Fractions (WAF's) were prepared for each treatment. The test substance was added to 12 L of reconstituted water in glass aspirator bottles (capacity 13.5 L). The solutions were mixed for approximately 24 hours using a 10% vortex (of the static liquid depth). The test solutions were removed through the outlet at the bottom of each mixing vessel into four replicates of 140 mL in 125 mL Erlenmeyer flasks (no headspace). Five daphnids were added to each replicate and the replicates were closed. The test was performed under static conditions with no aeration. Mean test temperature: 20.1°C (S.D. = 0.2), diurnal light: approximately 16 hours light and 8 hours dark with 125 to 178 lux during full daylight periods. Dissolved oxygen ranged from 8.4 to 8.7 mg/L and pH ranged from 7.5 to 8.0 during the study. Water hardness was 154 mg/L as $CaCO_3$. The daphnids were cultured in-house. Age was <24 hours old from 15-day old parents. Due to the relatively complex nature and limited water solubility of the test substance, the following exceptions to the guideline apply for this study: The concentration of the test substance in solution was not determined prior to use. It was deemed more appropriate to prepare individual treatment solutions by adding the test substance to dilution water and removing the WAF of each mixture for testing than to prepare dilutions of a stock solution.

<table>
<tr><td>Results:
Units/Value:
Note: Analytical method, biological observations, control survival.</td><td>Effect Loading (EL_{50}) / Effect Concentration (EC_{50}) Values (mg/L)
<table>
<tr><th></th><th>EL_{50}</th><th>EC_{50}</th></tr>
<tr><td>24 hours</td><td>>4.9*</td><td>>4.6*</td></tr>
<tr><td>48 hours</td><td>3.2 (CNC)</td><td>2.9 (CNC)</td></tr>
</table>
* Not a calculated value, no mortality was observed in the highest loading rate/concentration tested.
CNC = Could Not Calculate a confidence interval
The maximum actual loading rate causing no immobilization after 48-hours was <0.22 mg/L, one daphnid was immobilized at 0.22 mg/L, the lowest loading rate tested. The minimum actual loading rate causing 100% immobilization after 48-hours was 4.9 mg/L.
The maximum measured concentration causing no immobilization after 48-hours was <0.19 mg/L, one daphnid was immobilized at 0.19 mg/L, the lowest measured concentration tested. The minimum measured concentration causing 100% immobilization after 48-hours was 4.6 mg/L.
The method of analysis was automated static headspace gas chromatography with flame ionization detection (HS GC-FID).
<table>
<tr><th>Loading Rate (mg/L)</th><th>Measured Conc. (mg/L)</th><th colspan="2">% Immobilization</th></tr>
<tr><th></th><th></th><th>24 hour</th><th>48 hour</th></tr>
<tr><td>Control</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>0.22</td><td>0.19</td><td>0</td><td>5</td></tr>
<tr><td>0.43</td><td>0.35</td><td>0</td><td>0</td></tr>
<tr><td>1.0</td><td>0.85</td><td>0</td><td>0</td></tr>
<tr><td>2.3</td><td>2.0</td><td>0</td><td>5</td></tr>
<tr><td>4.9</td><td>4.6</td><td>0</td><td>100</td></tr>
</table></td></tr>
<tr><td>Conclusion:</td><td>After Daphnia magna were exposed to WAFs prepared from Low Dicyclopentadiene Resin Oil for 48-hours, the EL_{50} was 3.2 mg/L and the EC_{50} was 2.9 mg/L.</td></tr>
<tr><td>Reliability:</td><td>1-Reliable without restrictions.</td></tr>
<tr><td>Reference:</td><td>ExxonMobil Biomedical Sciences, Inc. 2003. Daphnia sp., ACUTE IMMOBILIZATION TEST on LOW DICYCLOPENTADIENE RESIN OIL. Study # 163042</td></tr>
<tr><td>Other (source):</td><td>Olefins Panel, American Chemistry Council</td></tr>
</table>

Robust Summary
Fish Acute Toxicity

Test Substance:	Low Dicyclopentadiene Resin Oil (Low DCPD Resin Oil) CAS No. 68477-54-3. Distillates, petroleum, steam-cracked, C8-12 fraction. This stream can also be described by CAS No. 68516-20-1. Naphtha, petroleum, steam-cracked middle arom. Low DCPD Resin Oil is a C8 to C10 distillate obtained from a pyrolysis gasoline stream produced by an ethylene production process (steam cracking process). The sample tested consisted of vinyltoluenes (17%), trimethylbenzenes (9%), styrene and methylstyrenes (3%), indene (14%), methylindene (8%), and naphthalene (1%). The balance of the composition is expected to consist of other hydrocarbons with carbon range primarily 8 to 10, mainly aromatics and olefins, with some paraffins.
Method/Guideline:	OECD Guideline 203
Year (guideline):	1992
Type (test type):	Fish Acute Toxicity Test
GLP (Y/N):	Yes
Year (study performed):	2003
Species:	*Oncorhynchus mykiss*
Analytical Monitoring:	Yes
Exposure Period:	96 hours
Statistical Method:	The 6 hour, 24 hour, 48 hour and 72 hour LL_{50} and LC_{50} values were determined using a Binomial Method (Stephan, 1977), a Trimmed Spearman-Karber Method (Hamilton et al.,1977). was used to determine the 96 hour LL_{50} and LC_{50} values. Stephan, C. E., Methods for Calculating an LC_{50}, *Aquatic Toxicology and Hazard Evaluation, ASTM STP 634*, F. L. Mayer and J. L. Hamelink, Eds., American Society for Testing and Materials, 1977, pp. 65-84. Hamilton, M., R. Russo, R. Thurston, 1977. Trimmed Spearman-Karber Method for Estimating Median Lethal Concentrations in Toxicity Bioassays. *Environmental Science and Technology*, Vol. 11, No. 7, p.714-719.
Test Conditions: • **Note: Concentration preparation, vessel type, volume, replication, environmental conditions, organisms supplier, loading, deviations from guideline or protocol.**	Individual Water Accommodated Fractions (WAF's) were prepared for each treatment. The test substance was added to 19 L of reconstituted water in glass aspirator bottles (capacity 22 L). The solutions were mixed for 24 hours using a 3% vortex (of the static liquid depth). The test solutions were removed through the outlet at the bottom of each mixing vessel into three replicates of 4.5 L in 4 L size aspirator bottles (no headspace). Four fish were added to each replicate and the replicates sealed. Daily renewals were performed by removing ~90% of the test solution through the outlet at the bottom of the aspirator bottle and refilling with fresh solution. The fish were received from Thomas Fish Company, Anderson, CA. The fish were not fed during the study. They were held for 13 days in study dilution water prior to use and were 36 days old at the start of the study. Fish mean weight = 0.226 g, mean total length = 3.4 cm, test loading = 0.201 g of fish/L.

	Mean test temperature: 13.6°C (S.D. = 0.2), diurnal light: approximately 16 hours light and 8 hours dark with 627 to 635 Lux during full daylight periods. Dissolved oxygen ranged from 6.6 to 8.7 mg/L and pH ranged from 7.2 to 8.1 during the study. Water hardness was 104 mg/L as $CaCO_3$. Due to the complex nature and limited water solubility of the test substance, the following exceptions to the guideline apply for this study: The concentration of the test substance in solution was not determined prior to use. It was deemed more appropriate to prepare individual treatment solutions by adding the test substance to dilution water and removing the WAF of each mixture for testing than to prepare dilutions of a stock solution.
Results: **Units/Value:** **Note: Analytical method, biological observations, control survival.**	The maximum actual loading rate causing no mortality after 96-hours was 2.1 mg/L. The maximum measured concentration causing no mortality after 96-hours was 1.8 mg/L. The minimum actual loading rate causing 100% mortality after 96-hours was 10 mg/L. The minimum measured concentration causing 100% mortality after 96-hours was 9.8 mg/L. Lethal Loading (LL_{50}) / Lethal Concentration (LC_{50}) Values (mg/L) 3 hours: LL_{50} >10*; LC_{50} >9.8* 6 - 72 hours: LL_{50} 6.7 (4.5-10†); LC_{50} 6.6 (4.4-9.8†) 96 hours: LL_{50} 6.3 (5.5-7.1‡); LC_{50} 6.1 (5.3-7.0‡) * Not a calculated value, 42% mortality was observed in the highest loading rate/concentration tested. Values in parentheses are 95% confidence intervals unless otherwise noted. † 99% confidence interval ‡ 95% confidence interval The method of analysis was automated static headspace gas chromatography with flame ionization detection (HS GC-FID). Summary of In-Life observations - % Mortality Loading Rate (mg/L): Control; 0.43; 0.92; 2.1; 4.5; 10 Meas. Conc. (mg/L): 0; 0.41; 0.84; 1.8; 4.4; 9.8 3 hours: 0; 0; 0; 0; 0; 42 6 - 72 hours: 0; 0; 0; 0; 0; 100 96 hours: 0; 0; 0; 0; 8; 100
Conclusion:	After *Oncorhynchus mykiss* were exposed to WAFs prepared from Low Dicyclopentadiene Resin Oil for 96-hours, the LL_{50} was 6.3 mg/L and the LC_{50} was 6.1 mg/L.
Reliability:	1-Reliable without restrictions.
Reference:	ExxonMobil Biomedical Sciences, Inc. 2003. FISH, ACUTE TOXICITY TEST on LOW DICYCLOPENTADIENE RESIN OIL. Study # 163058
Other (source):	Olefins Panel, American Chemistry Council

Robust Summary
Biodegradation

Test Substance:	Low Dicyclopentadiene Resin Oil (Low DCPD Resin Oil) CAS No. 68477-54-3. Distillates, petroleum, steam-cracked, C8-12 fraction. This stream can also be described by CAS No. 68516-20-1. Naphtha, petroleum, steam-cracked middle arom. Low DCPD Resin Oil is a C8 to C10 distillate obtained from a pyrolysis gasoline stream produced by an ethylene production process (steam cracking process). The sample tested consisted of vinyltoluenes (17%), trimethylbenzenes (9%), styrene and methylstyrenes (3%), indene (14%), methylindene (8%), and naphthalene (1%). The balance of the composition is expected to consist of other hydrocarbons with carbon range primarily 8 to 10, mainly aromatics and olefins, with some paraffins.
Method/Guideline:	OECD Guideline 301F
Year (guideline):	1992
Type (test type):	Ready Biodegradability: Manometric Respirometry Test
GLP (Y/N):	Yes
Year (study performed):	2003
Inoculum:	Domestic activated sludge
Exposure Period:	41 Days
Test Conditions: • **Note: Concentration preparation, vessel type, replication, test conditions.**	Triplicate test systems were used to evaluate the biodegradability of the test and positive control substances at mean concentrations of 50.13 mg/L and 49.13 mg/L, respectively. Blank test systems, which did not contain the test or positive control substance, were run concurrently in triplicate. The total suspended solids (TSS) of the activated sludge was determined to be 4.13 g/L. The inoculum was added at a 1% loading volume of sludge supernatant to test medium. The microbial count of the inoculum was 10^6 CFU/mL. One liter of test medium, which was aerated for 24 hours with carbon dioxide free air, was added to each one liter respirometer flask. The test substance was weighed in an air tight syringe and injected into the test medium. The test system was sealed immediately after addition of the test substance. An aliquot of the positive control stock solution was added to the appropriate test flasks. An unacclimated activated sludge inoculum was used in this study. The inoculum was obtained from the Clinton Sanitary Wastewater Treatment Plant, Annandale, NJ, USA. The treatment plant receives domestic sewage.

Test Conditions (cont'd): • **Note: Concentration preparation, vessel type, replication, test conditions.**	All test systems were placed on a Coordinated Environmental Services (CES) automated respirometer which automatically recorded the oxygen uptake in general agreement with the OECD guideline. The 41-day study was conducted at a temperature range of 22 ± 1°C.
Results: **Units/Value:** **Note: Deviations from protocol or guideline analytical method.**	Biodegradation was based on oxygen consumption and the theoretical oxygen demand of the test substance as calculated using results of an elemental analysis of the test substance. By day 14, >60% biodegradation of positive control was observed, which meets the guideline requirement. No deviations from the protocol occurred that affected the integrity of the study data. The average percent biodegradation of the test substance was determined to be 6.48% on day 41. The test substance cannot be considered readily biodegradable. Sample — % Degradation* (day 41) — Mean % Degradation (day 41) Test Substance — 6, 5, 9 — 6 Na Benzoate — 86, 91, 82 — 86 * replicate data
Conclusion:	Not readily biodegradable
Reliability:	(1)-Reliable without restriction.
Reference:	ExxonMobil Biomedical Sciences, Inc. 2003. Ready Biodegradability: Manometric Respirometry test. Study # 163094A
Other (source): (FT - SO)	Olefins Panel, American Chemistry Council

Robust Summary
Biodegradation

Test Substance:	Low Dicyclopentadiene Resin Oil (Low DCPD Resin Oil) CAS No. 68477-54-3. Distillates, petroleum, steam-cracked, C8-12 fraction. This stream can also be described by CAS No. 68516-20-1. Naphtha, petroleum, steam-cracked middle arom. Low DCPD Resin Oil is a C8 to C10 distillate obtained from a pyrolysis gasoline stream produced by an ethylene production process (steam cracking process). The sample tested consisted of vinyltoluenes (17%), trimethylbenzenes (9%), styrene and methylstyrenes (3%), indene (14%), methylindene (8%), and naphthalene (1%). The balance of the composition is expected to consist of other hydrocarbons with carbon range primarily 8 to 10, mainly aromatics and olefins, with some paraffins.
Method/Guideline:	OECD Guideline 301F
Year (guideline):	1992
Type (test type):	Ready Biodegradability: Manometric Respirometry Test
GLP (Y/N):	Yes
Year (study performed):	2003
Inoculum:	Acclimated Inoculum prepared from 163094A test systems.
Exposure Period:	56 Days
Test Conditions: • **Note: Concentration preparation, vessel type, replication, test conditions.**	Triplicate test systems with acclimated inoculum were used to evaluate the biodegradability of the test and positive control substances at mean concentrations of 47.20 mg/L and 51.49 mg/L, respectively. Blank test systems, which did not contain the test or positive control substance, were run concurrently in triplicate. Triplicate toxicity control test systems, containing both test and positive control substance, were also run concurrently. Acclimated Inoculum was prepared from solids filtered from 163094A test systems. The inoculum for 163094A test systems was obtained from the Clinton Sanitary Wastewater Treatment Plant, Annandale, NJ, USA which receives domestic sewage. The solids were mixed with 200 mL of fresh test medium and added at a 1% loading volume of solids mixture to test medium. The microbial count of the inoculum was 10^4 CFU/mL. The test medium was aerated for 24 hours with carbon dioxide free air and one liter added to each one liter respirometer flask.

Test Conditions (cont'd): • **Note: Concentration preparation, vessel type, replication, test conditions.**	The test substance was weighed in an air tight syringe and injected into the test medium. The test system was sealed immediately after addition of the test substance. An aliquot of the positive control stock solution was added to the appropriate test flasks. All test systems were placed on a Coordinated Environmental Services (CES) automated respirometer which automatically recorded the oxygen uptake in general agreement with the OECD guideline. The 56 day study was conducted at a temperature range of 22 ± 1°C.
Results: **Units/Value:** **Note: Deviations from protocol or guideline analytical method.**	Biodegradation was based on oxygen consumption and the theoretical oxygen demand of the test substance as calculated using results of an elemental analysis of the test substance. By day 14, >60% biodegradation of the positive control was observed, which meets the guideline requirement. No deviations from the protocol occurred that affected the integrity of the study data. The mean biodegradation of the test substance was determined to be 43.87% by day 56. The toxicity control exceeded 25% therefore the test substance cannot be considered inhibitory. Sample — % Degradation* (day 56) — Mean % Degradation (day 56) Test Substance — 44, 43, 45 — 44 Na Benzoate — 80, 86, 75 — 80 Toxicity Control — 53, 48, 54 — 52 * replicate data
Conclusion:	Not readily biodegradable Not Inhibitory at loading concentration of approximately 50 mg/L.
Reliability:	(1)-Reliable without restriction.
Reference:	ExxonMobil Biomedical Sciences, Inc. 2003. Ready Biodegradability: Manometric Respirometry test. Study # 163094A(A)
Other (source): (FT - SO)	Olefins Panel, American Chemistry Council

Boiling Point

Test Substance:

Low Dicyclopentadiene Resin Oil (Low DCPD Resin Oil). CAS No. 68477-54-3. Distillates, petroleum, steam-cracked, C8-12 fraction. This stream can also be described by CAS No. 68516-20-1. Naphtha, petroleum, steam-cracked middle arom.

Low DCPD Resin Oil is a C8 to C10 distillate obtained from a pyrolysis gasoline stream produced by an ethylene production process (steam cracking process). The sample tested consisted of vinyltoluenes (17%), trimethylbenzenes (9%), styrene and methylstyrenes (3%), indene (14%), methylindene (8%), and naphthalene (1%). The balance of the composition is expected to consist of other hydrocarbons with carbon range primarily 8 to 10, mainly aromatics and olefins, with some paraffins.

Method/Guideline: EEC A2 / OECD 103

Year (guideline): 1993 / 1995

Type (test type): Boiling Point (distillation method)

GLP: Yes

Year (study performed): 2003

Pressure Corrected to Standard Atmospheric

Boiling Point Value: 174 - 193 Deg C

Test Conditions:

- **Note: Concentration prep., vessel type, replication, test conditions.**

Test substance added to distillation flask and heated at a rate which results in initial drops of distillate condensing after approximately 15 minutes. On boiling, the heating rate was adjusted in order that the distillation rate was approximately 3 - 4 mL/min. Procedure performed in duplicate.

Results:

Units/Value:

Results of duplicate measurements:

Run I	initial B.P. 173 Deg C	final B.P. 192 Deg C
Run II	initial B.P 174 Deg C	final B.P. 193 Deg C

Mean 174 - 193 Deg C

A small amount of thick brown residue remained in the flask at the end of the test.

Reliability: (1) Reliable without restriction

Reference: Huntingdon Life Sciences, Ltd. 2003, Physicochemical Properties for Low Dicyclopentadiene Resin Oil. Study EXN047/033073.

Other (source): Olefins Panel, American Chemistry Council

Partition Coefficient

Test Substance:	CAS No.: 26472-00-4, Methylcyclopentadiene Dimer Concentrate (MCPD Dimer Concentrate). The test substance contained 90.8% MCPD Dimer, 2.6% MCPD and 1.6% Cyclopentadiene (CPD)-MCPD codimer. The balance of the stream consisted of other hydrocarbons, primarily C4-C7 codimers of MCPD or CPD. CAS Inventory Name: 4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydrodimethyl-
Method/Guideline:	EEC A8 / OECD 117
Year (guideline):	1993 / 1989
Type (test type):	N-Octanol/Water Partition Coefficient (HPLC method)
GLP:	Yes
Year (study performed):	2003
Temperature:	25 Deg C
Log P_{ow} Value:	5.5 - 5.7
Test Conditions:	
• **Note: Concentration prep., vessel type, replication, test conditions.**	Test substance was evaluated at a concentration of 271 mg/L prepared in HPLC mobile phase (3:1 methanol:water). HPLC analysis was performed on a Hewlett Packard 1050 Liquid Chromatograph with an Inertsil 5um C8 (15cm x 4.6mm id) column with a 1 mL/min flow rate, 10uL injection volume and UV detection at 210 nm. Six reference compounds (with known log P_{ow} values), each at approximately 50 mg/L , were analyzed in a combined solution including nitrobenzene (1.9), ethylbenzoate (2.6), bromobenzene (3.0), benzylbenzoate (4.0), triphenylamine (5.7) and DDT (6.2). Additionally, an unretained standard of 4,5-dihydroxynaphthalene-2,7-disulphonic acid, disodium salt was analyzed to determine the system deadtime. Two sets of reference mixture and test substance runs were performed.
Results:	
Units/Value:	Three principal components detected with Log P_{ow} values between 5.5 and 5.7 (calculated from the mean exponential regression of reference compounds).
Reliability:	(1) Reliable without restriction
Reference:	Huntingdon Life Sciences, Ltd. 2003, Physicochemical Properties for Methylcyclopentadiene Concentrate Study EXN040/032421.
Other (source):	Olefins Panel, American Chemistry Council

Vapor Pressure

Test Substance:	Low Dicyclopentadiene Resin Oil (Low DCPD Resin Oil) CAS No. 68477-54-3. Distillates, petroleum, steam-cracked, C8-12 fraction. This stream can also be described by CAS No. 68516-20-1. Naphtha, petroleum, steam-cracked middle arom. Low DCPD Resin Oil is a C8 to C10 distillate obtained from a pyrolysis gasoline stream produced by an ethylene production process (steam cracking process). The sample tested consisted of vinyltoluenes (17%), trimethylbenzenes (9%), styrene and methylstyrenes (3%), indene (14%), methylindene (8%), and naphthalene (1%). The balance of the composition is expected to consist of other hydrocarbons with carbon range primarily 8 to 10, mainly aromatics and olefins, with some paraffins.
Method/Guideline:	EEC A4 / OECD 104
Year (guideline):	1993 / 1995
Type (test type):	Vapor Pressure (static measurement procedure)
GLP:	Yes
Year (study performed):	2003
Temperature:	25 Deg C
Vapor Pressure Value:	4100 Pa
Test Conditions: • **Note: Concentration prep. vessel type, replication, test conditions.**	Test conducted at five temperatures between 303 and 323 Deg K (30 and 50 Deg C). Actual test temperatures were 303.15, 308.15, 313.15, 318.15 and 323.15. Duplicate measurements made at each temperature.
Results: **Units/Value:**	Mean vapor pressures were as follows: 4700 Pa at 303.15 Deg K 5700 Pa at 308.15 Deg K 6500 Pa at 313.15 Deg K 7500 Pa at 318.15 Deg K 8600 Pa at 323.15 Deg K 4100 Pa at 25 Deg C (calculated from linear regression)
Reliability:	(1) Reliable without restriction
Reference:	Huntingdon Life Sciences, Ltd. 2003, Physicochemical Properties for Low Dicyclopentadiene Resin Oil. Study EXN047/033073.
Other (source):	Olefins Panel, American Chemistry Council

Robust Summary: Category
Genetic Toxicity - in Vitro

Test Substance *Test substance*	Low Dicyclopentadiene (DCPD) Resin Oil, CAS# 68477-54-3; stable at room temperature below 70° F; colorless- light yellow liquid Olefins Panel HPV Stream Name: Low DCPD Resin Oil Low DCPD Resin Oil is a C8 to C10 distillate obtained from a pyrolysis gasoline stream produced by an ethylene production process (steam cracking process). The sample tested consisted of vinyltoluenes (17%), trimethylbenzenes (9%), styrene and methylstyrenes (3%), indene (14%), methylindene (8%), and naphthalene (1%). The balance of the composition is expected to consist of other hydrocarbons with carbon range primarily 8 to 10, mainly aromatics and olefins, with some paraffins. Low DCPD Resin Oil can also be described as CAS number 68516-20-1. Note: the above composition percentages were summarized from data reported by the supplier of the test substance on February 10, 2003.
Method Methods/guidelines followed	OECD Guideline 471 (Genetic Toxicology: Bacterial Reverse Mutation Test), adopted July 1997 (published February 1998), OPPTS Guideline 870.5100 (Bacterial Reverse Mutation Test) and EC Commission Directive 2000/32/EC.
System of testing	*Salmonella typhimurium* and *Escherichia coli* with and without S9
GLP	Yes
Year	2003
Species/Strain	*S. typhimurium* TA98, TA100, TA1535, TA1537 and *E. coli* WP2 *uvr*A.
Metabolic activation	Yes
Species and cell type Quantity Induced or not induced	Sprague-Dawley rat liver (S9 fraction) prepared in-house 10% S9 in S9 mix Aroclor 1254 induced, rats were given 500mg/kg ip 5 days prior to sacrifice
Concentrations tested	75, 200, 600, 1800 and 5000 µg/plate
Statistical Methods	None
Remarks for Test Conditions	Criteria for positive response were a dose-related increase in the mean revertants per plate of at least one tester strain over a minimum of two increasing concentrations as specified below: TA1535, TA1537: At the peak of the dose response an equal to or greater than 3.0-fold dose related increase over solvent control values with or without metabolic activation. TA98, TA100, *E. coli* WP2 *u*vrA: At the peak of the dose response an equal to or greater than 2.0-fold dose related increase over solvent control values with or without metabolic activation. Negative controls: Based on historical control data, all tester strains must exhibit characteristic numbers of spontaneous revertants per plate. Positive controls: The mean of each positive control value must exhibit at least a 3.0-fold increase over the respective mean negative control value (vehicle) for each tester strain.

	Low DCPD Resin Oil test solutions were prepared in ethanol immediately prior to use. *Salmonella* strains and *E. coli* WP2 *uvr*A (approx. 10^9 cells/mL) were exposed to either test solution or vehicle ±S9 by the plate incorporation method. The preliminary toxicity test was conducted prior to the mutagenicity test with all tester strains over a range of 6.7 to 5000 µg/plate (one plate per dose) ±S9. The dose levels tested in the mutagenicity test were 75, 200, 600, 1800 and 5000 µg/plate ±S9. The mutagenicity test was conducted on triplicate plates per dose. Five hundred (500) microliters of S9 or Sham mix, 100 µL of tester strain and 50 µL vehicle or test substance dilution were added to 2.0 mL of molten selective top agar at 45±2°C. After vortexing, the mixture was overlaid onto the surface of minimal agar plates. After the overlay had solidified, the plates were inverted and incubated for approximately 48 to 72 hours at 37±2°C. Revertant colonies for a given tester strain and activation condition, except for the positive controls, were counted either entirely by automated colony counter or entirely by hand unless the plate exhibited toxicity, and conditions of background lawn and precipitation were evaluated. Positive control compounds for the –S9 condition were: 2-nitrofluorene (1.0 µg/plate) for TA98; sodium azide (1.0 µg/plate) for TA100 and TA1535; 9-aminoacridine (75 µg/plate) for TA1537; and methyl methanesulfonate (1000 µg/plate) for WP2*uvr*A. The positive control compound for the +S9 condition was 2-aminoanthracene, 1.0 µg/plate for all *Salmonella* strains, and 10 µg/plate for WP2*uvr*A.
Results Genotoxic effects	In the preliminary toxicity test, the maximum dose tested was 5000 µg per plate; this dose was achieved using a concentration of 100 mg/mL and a 50 µL plating aliquot. The dose levels tested were 6.7, 10, 33, 67, 100, 333, 667, 1000, 3333 and 5000 µg per plate. Toxicity was observed with some conditions beginning at 3333 or at 5000 µg per plate. Precipitate was observed beginning at 3333 or at 5000 µg per plate. Based on the findings of the preliminary toxicity test, the maximum dose plated in the mutagenicity test was 5000 µg per plate. In the mutagenicity test, the maximum dose tested was 5000 µg per plate; this dose was achieved using a concentration of 100 mg/mL. The test substance solution was clear at this concentration. The dose levels tested were 75, 200, 600, 1800 and 5000 µg per plate. Toxicity was observed with some conditions beginning at 1800 or at 5000 µg per plate. Precipitate was observed at 5000 µg per plate with most test conditions. Low DCPD Resin Oil did not induce a dose-related or 2.0-fold or 3.0-fold increase in the number of revertant colonies in any *Salmonella* strain or in *E. coli* WP2 *u*vrA ±S9. The vehicle controls were acceptable, and the positive control compounds responded appropriately.
Conclusions	Low DCPD Resin Oil did not induce a significant increase in revertant colonies in *Salmonella* strains or in *E. coli* WP2 *uvr*A with or without rat liver metabolic activation at any dose level and is not considered a mutagen in this test system.
Data Quality *Reliabilities*	**(1)** Reliable without restrictions
Reference	Wagner, V.O. and Hines, R.M. 2003. Low DCPD Resin Oil: Bacterial Reverse Mutation Test. AA75HB.502.BTL. Unpublished Report (DuPont-12984)
Other *Last changed*	16 June 2004

Resin Oils and Cyclodiene Dimer Concentrates Category

Genetic Toxicity - In Vivo

Test Substance	
Remarks	Low Dicyclopentadiene Resin Oil (Low DCPD Resin Oil), CAS #68477-54-3, purity NA; stable at room temperature below 70 F; clear colorless liquid; Olefins Panel HPV Stream Name: Low DCPD Resin Oil Low DCPD Resin Oil is a C8 to C10 distillate obtained from a pyrolysis gasoline stream produced by an ethylene production process (steam cracking process). The sample tested consisted of vinyltoluenes (17%), trimethylbenzenes (9%), styrene and methylstyrenes (3%), indene (14%), methylindene (8%), and naphthalene (1%). The balance of the composition is expected to consist of other hydrocarbons with carbon range primarily 8 to 10, mainly aromatics and olefins, with some paraffins. Low DCPD Resin Oil can also be described as CAS number 68516-20-1. *Note: The above percentages were summarized from data reported by the supplier of the test substance on February 10, 2003.*
Method	
Methods/guidelines followed	OPPTS 870.5395 OECD 474 EC Commission Directive 2000/32/EC
Type	Mammalian erythrocyte micronucleus assay.
GLP	Yes
Year	2003
Species	Mouse
Strain	Crl:CD-1®(ICR)BR
Sex	Male and female
Route of administration	Twice by oral intubation, at an approximate 24-hour interval
Vehicle	Corn oil
Doses/concentration levels	0, 437.5, 875, or 1750 mg/kg body weight
No. of animals per dose	5/sex/group (0, 437.5, or 875 mg/kg body weight), 7/sex/group (1750 mg/kg body weight).
Control groups and treatment	5/sex vehicle control animals (corn oil); 5/sex positive control (cyclophosphamide, 30 mg/kg once by oral intubation)
Statistical methods	Total polychromatic erythrocytes (PCEs), micronucleated polychromatic erythrocytes, normochromatic erythrocytes (NCEs) were compared to the control using Dunnett's and Dunn's test ($p < 0.05$).
Test Conditions.	Groups of 5 mice/sex/group (7 mice/sex at the highest dose level) were administered the test substance twice (once per day for 2 days) at an approximate 24 hour interval by oral intubation (gavage). Body weights ranged from 23.6-28.3 g (males) and 19.1-23.6 g (females) at time of arrival. The animals were approximately 7 weeks old (49 days) at time of exposure. The homogeneity / concentration of the dosing formulations and the test substance stability were verified analytically. The mice were weighed prior to treatment and sacrifice. The mice were observed for clinical signs and mortality/moribundity prior to treatment, approximately 1 hour post-dosing, 3-5 hours post-dosing, and prior to sacrifice. The mice were sacrificed approximately 24 hours after administration of the second dose and smears of

	bone marrow erythrocytes were prepared and stained. 2000 PCEs per animal were scored for the presence of micronuclei. The proportion of PCEs among 1000 total erythrocytes was determined for each animal, and expressed as the PCE/NCE ratio.
Results	No clinical signs of toxicity were observed in male animals in any dose group at any timepoint. One female animal (1/7) at 1750 mg/kg exhibited lethargy at the 1 hour post-dosing observation period. No clinical signs of toxicity were observed in female animals at 875 or 427.5 mg/kg. Test substance-related biologically relevant changes were observed in body weight and body weight gains in both male or female mice administered Low DCPD Resin Oil. However, only the body weight losses in females at 875 mg/kg (~7% body weight loss) and 1750 mg/kg (~15% body weight loss) were considered biologically relevant and a sign of systemic toxicity. No morbidity or mortality occurred in either males or females. No statistically significant or biologically relevant effects on micronuclei frequencies were observed in the bone marrow cells in any dose group treated with Low DCPD Resin Oil. Although not statistically significant, a depression of approximately 16% in the PCE/NCE ratio was seen at 1750 mg/kg in males and 43% in females. These decreases may be indicative of bone marrow toxicity and considered biologically equivocal. The vehicle and positive control groups exhibited a response consistent with the laboratory's historical control data. The positive control, cyclophosphamide, induced a significant increase in the frequency of micronucleated PCEs ($p < 0.05$).
Conclusions	The negative and positive controls met the requirements for a valid study. Under the conditions of this study, Low DCPD Resin Oil, did not induce a statistically significant increase in micronucleated polychromatic erythrocytes in male or female mouse bone marrow when evaluated after two administrations, approximately 24 hours apart. The highest dose administered on the study was 1750 mg/kg body weight. The test substance was considered negative in this *in vivo* assay.
Data Quality *Reliabilities*	(1) Reliable without restrictions. Guideline study.
References	Donner, M.E., Low Dicyclopentadiene Resin Oil: Mouse Bone Marrow Micronucleus Test, DuPont Haskell Laboratory Report Number DuPont-13027.
Other *Last changed*	26-Mar-2003

Low Dicyclopentadiene Resin Oil : Combined Repeated Dose Toxicity Study and Reproductive/Developmental Toxicity Screening Test in Rats

Repeated Dose Toxicity

Test Substance	
Remarks	Low DCPD Resin Oil is a C8 to C10 distillate obtained from a pyrolysis gasoline stream produced by an ethylene production process (steam cracking process). The sample tested consisted of vinyltoluenes (17%), trimethylbenzenes (9%), styrene and methylstyrenes (3%), indene (14%), methylindene (8%), and naphthalene (1%). The balance of the composition is expected to consist of other hydrocarbons with carbon range primarily 8 to 10, mainly aromatics and olefins, with some paraffins. CAS Numbers Primary: 68477-54-3 Other Number used to represent this stream: 68516-20-1
Method	
Method/guideline followed	OECD 422
Test type	Combined repeated dose toxicity study with the reproduction / developmental screening test
GLP	Yes.
Year	2003
Species	Rat
Strain	Crl:CD® (Sprague-Dawley) IGS BR
Route of administration	Gavage
Duration of test	4 Weeks
Doses/concentration levels	0, 35, 125, 375 mg/kg/day
Sex	12 male, 12 female per group.
Exposure period	Not applicable
Frequency of treatment	7 days/week
Control group and treatment	12 male, 12 female, corn oil vehicle.
Post exposure observation period	Not applicable.
Statistical methods	Group means and standard deviations were calculated for all measured parameters. Body weight, weight gain, food consumption, and organ weights were analyzed by Jonckheere-Terpstra trend test. Food efficiency and clinical pathology parameters were analyzed by one-way analysis of variance followed with Dunnett's test. Clinical observations and FOB parameters were analyzed by Cochran-Armitage trend test. Grip strength, foot splay, rearing, body temperature, and motor activity were analyzed by repeated measures analysis of variance with linear contrasts or Jonckheere's trend test.
Test conditions	Groups of 12 young, adult, male or nulliparous, female rats were administered an oral, daily dose of 0, 35, 125, or 375 mg/kg/day Low DCPD Resin Oil for approximately 30 days. The study also contained reproductive and developmental toxicity satellite groups (summarized separately). After approximately 30 days, blood samples were collected from all male rats and all subchronic female rats for measurement of hematology and clinical chemistry parameters. A neurobehavioral test battery, consisting of motor activity and functional observational battery assessments, was conducted on all male rats and subchronic female rats prior to test substance administration in order to obtain baseline measurements. This neurobehavioral test battery was

conducted again following approximately 4 weeks of test substance administration. On test days 30 and 31, respectively, all subchronic male and female rats underwent gross necropsy. Selected tissues from the control and 375 mg/kg/day groups, and target tissues from all groups were processed for histopathology and examined.

Results

NOAEL (NOEL)

Parameters	NOEL (mg/kg/day)	NOAEL (mg/kg/d1)	LOEL (mg/kg/d1)
Systemic	35 M 35 F	35 M 35 F	125 M 125 F
Neurobehavioral	375 M 375 F	375 M 375 F	- -
Pathology	- 35 F	125 M 375 F	35 M 125 F

LOAEL (LOEL)

See table above

Remarks

Clinical Signs of Toxicity and Mortality in Subchronic Males and Females: Test substance-related increases in the incidences of stained fur, and/or wet fur were observed in males and subchronic females following administration of 375 mg/kg/day Low DCPD Resin Oil. Stained and/or wet fur were also occasionally observed in males and subchronic females administered 125 mg/kg/day. These clinical signs were not present during either the detailed clinical observations in an open field arena, or during the FOB evaluation. Test substance-related mortality did not occur.

Body Weight and Body Weight Gain in Subchronic Males and Females: Test substance-related decreases in body weight and/or weight gain were observed in males and subchronic females administered 375 mg/kg/day of the test substance. In addition, decreased body weight and/or weight gain were also observed in males administered 125 mg/kg/day of the test substance. Body weight and weight gain of 375 mg/kg/day males was 10% and 24% lower than control values for test days 29 and 1-29, respectively. Body weight and weight gain of 125 mg/kg/day males was 7% and 16% lower than the control values for test days 29 and 1-29, respectively. Body weight and weight gain of 375 mg/kg/day subchronic females was 5% and 14% lower than the control values for test days 29 and 1-29, respectively.

Food Consumption and Food Efficiency in Subchronic Males and Females: Food consumption and food efficiency were reduced in 125 mg/kg/day and above males, and food consumption was decreased in 375 mg/kg/day females.

Clinical Pathology Parameters: There were no test substance-related adverse effects on hematological or clinical chemistry parameters in male or subchronic female rats.

Neurobehavioral Parameters: No test substance-related effects were observed in motor activity, any neurobehavioral parameters in the FOB, or in grip strength, foot splay, rearing, or body temperature, in males or subchronic females.

Pathology: Administration of 35, 125, or 375 mg/kg/day of the test substance for approximately 30 days produced a dose-related increase in renal tubular hyaline droplets in male rats, however, hyaline droplet nephropathy was not observed. Increased hyaline droplets were not observed in females. The hyaline droplet accumulation in male rats was not considered to be an adverse effect of the test substance, since it is species and sex specific, and is not predictive of an effect on other species.

Minimal to mild hepatocellular hypertrophy, and associated increases in liver

	weight parameters were observed in 375 mg/kg/day males, and in 125 and 375 mg/kg/day females; however, this change is considered to be secondary to enzyme induction as a pharmacological response to a xenobiotic, and was not considered to be adverse. A slight increase in the incidence of minimal thyroid follicular cell hypertrophy was observed in 375 mg/kg/day males, which was considered to be test substance-related and potentially adverse. Thymus weight was decreased in 125 and 375 mg/kg/day males, and in 375 mg/kg/day females. However, there was no corresponding microscopic effect on the thymus.
Conclusions	Repeated administration of Low Dicyclopentadiene Resin Oil in male and female Sprague Dawley rats at dosages of 375 mg/kg/day produced effects on clinical signs of toxicity, body weight, food consumption, and histopathological changes. In addition, effects on body weight, clinical signs and food consumption were observed at 125 mg/kg/day. Based on these data, the no-observable-effect level (NOAEL) for systemic toxicity was 35 mg/kg/day in males and 35 mg/kg/day in females.
Data Quality Reliabilities	Klimish value = 1 (Reliable without restrictions).
References	Malley, L. A. Low Dicyclopentadiene Resin Oil: Combined Repeated Dose Toxicity Study and Reproductive/Developmental Toxicity Screening Test in Rats. DuPont-13041. Report of E. I. du Pont de Nemours and Company conducted for the American Chemistry Council Olefins Panel.
Other Last changed	29-Oct-04 Robust summary prepared by contract for Olefins Panel

Low Dicyclopentadiene Resin Oil : Combined Repeated Dose Toxicity Study and Reproductive/Developmental Toxicity Screening Test in Rats

Toxicity to Reproduction

Test Substance	
Remarks	Low DCPD Resin Oil is a C8 to C10 distillate obtained from a pyrolysis gasoline stream produced by an ethylene production process (steam cracking process). The sample tested consisted of vinyltoluenes (17%), trimethylbenzenes (9%), styrene and methylstyrenes (3%), indene (14%), methylindene (8%), and naphthalene (1%). The balance of the composition is expected to consist of other hydrocarbons with carbon range primarily 8 to 10, mainly aromatics and olefins, with some paraffins. CAS Numbers Primary: 68477-54-3 Other Number used to represent this stream: 68516-20-1
Method	
Method/guideline followed	OECD 422
Test type	Combined repeated dose toxicity study with the reproduction / developmental screening test
GLP	Yes.
Year	2003
Species	Rat
Strain	Crl:CD® (Sprague-Dawley) IGS BR
Route of administration	Gavage.
Duration of test	Satellite groups of 12 young, nulliparous, female rats were administered an oral, daily dose of the test substance during a premating period of approximately 2 weeks, a cohabitation period of approximately 2 weeks, a gestation period of approximately 3 weeks, and a lactation period of approximately 4 days. The males were exposed for 30 days.
Doses/concentration levels	0, 35, 125 or 375 mg/kg/day.
Sex	12 males, 12 females per group.
Exposure period	Not applicable
Frequency of treatment	7 days/week
Control group and treatment	12 male, 12 female, corn oil vehicle.
Post exposure observation period	Not applicable.
Statistical methods	Group means and standard deviations were calculated for all measured parameters. Body weight, weight gain, food consumption, and organ weights were analyzed by Jonckheere-Terpstra trend test. Food efficiency was analyzed by one-way analysis of variance followed with Dunnett's test. Clinical observations, mating index, fertility index, and gestation index were analyzed by Cochran-Armitage trend test. Gestation length, implantation site numbers, implantation efficiency, mean number of pups per litter, percent of pups born alive, day 0-4 viability of pups, viability index, number of *corpora lutea*, sex ratio, pre-implantation loss, and post-implantation loss were analyzed by Jonckheere-Terpstra trend test. Mean pup weights were analyzed by linear contrast of the least square means.
Test Conditions	Satellite groups of 12 young, nulliparous, female rats were administered an oral, daily dose of 0, 35, 125, or 375 mg/kg/day during a premating period of approximately 2 weeks, a cohabitation period of approximately 2 weeks, a gestation period of approximately 3 weeks, and a lactation period of

approximately 4 days. Following the 2-week premating period, each satellite female was paired with a male of the same respective dosage group during a 2 week cohabitation period. Measurements of body weight, food consumption, and clinical signs of toxicity in females were conducted throughout premating, cohabitation, gestation, and lactation. After postpartum day 4, lactating females, and nonpregnant females were sacrificed, selected organs were weighed, and selected tissues were evaluated microscopically. Offspring were evaluated for external abnormalities, and sacrificed on postnatal day 4. The study design included a main study for repeated dose toxicity end points (summarized separately).

The males were exposed for a total of 30 days, and were then necropsied. In addition to the repeated dose toxicity end points assessed (discussed separately), reproductive assessment of the males included mating, conception and fertility indices, reproductive organ weights and gross/histopathology of the reproductive tract.

Results

NOAEL (NOEL)

Parameters	NOEL (mg/kg/day)	NOAEL (mg/kg/d1)	LOEL (mg/kg/d1)
Systemic	35 M 35 Satellite F	35 M 35 Satellite F	125 M 125 Satellite F
Pathology			
Paternal	- M	125 M	35 M
Reproductive	375 M 375 Satellite F	375 M 375 Satellite F	- -
Reproductive	375 M 375 Satellite F	375 M 375 Satellite F	- -
Developmental (Pups)	125	125	375

LOAEL (LOEL)

See table above.

Remarks

Clinical signs and mortality: Test substance-related increases in the incidences of stained fur, and/or wet fur were observed in males, and satellite females following administration of 375 mg/kg/day Low DCPD Resin Oil. Stained and/or wet fur were also occasionally observed in males and satellite females administered 125 mg/kg/day.

Body weight and weight gain: Test substance-related decreases in body weight and/or weight gain were observed in males and satellite females administered 375 mg/kg/day of the test substance. In addition, decreased body weight and/or weight gain were also observed in males and satellite females administered 125 mg/kg/day of the test substance. Body weight and weight gain of 375 mg/kg/day males was 10% and 24% lower than control values for test days 29 and 1-29, respectively. Body weight and weight gain of 125 mg/kg/day males was 7% and 16% lower than the control values for test days 29 and 1-29, respectively. During the premating period, body weight and weight gain of 375 mg/kg/day satellite females was 3% and 14% lower than the control values for test days 15 and 1-15, respectively. During the gestation period, body weight and weight gain of 375 mg/kg/day satellite females was 6% and 9% lower than the control values for gestation days 21 and 0-21, respectively. During lactation, body weights of 125 and 375 mg/kg/day satellite females were 8% and 7% lower than the control values on lactation day 4, respectively.

Food Consumption and Food Efficiency: Decreased food consumption and food efficiency occurred in 125 mg/kg/day and above males.

Reproductive Indices: No test substance-related effects or statistically

	significant differences in mating index, fertility index, gestation length, number of implantation sites, implantation efficiency, pre-implantation loss, post-implantation loss, or number of *corpora lutea* were observed for any dosage of the test substance in satellite females. *Offspring Parameters*: Decreased mean pup weight (15% lower than the control value on lactation day 4) was observed in offspring from the 375 mg/kg/day group. No effects were observed at any dosage for the number of pups born, number of pups born alive, sex ratio, gestation index, external abnormalities, or litter survival for postnatal days 0-4 in the offspring from any dosage group. *Reproductive Pathology*: There were no test substance-related effects on morphology of the reproductive tract in either males or females.
Conclusions	Repeated administration of Low Dicyclopentadiene Resin Oil to male and female Sprague Dawley rats at dosages of 0, 35, 125, or 375 mg/kg/day produced no evidence of adverse effects on any measures of reproductive function. Pups from the 375 mg/kg/day group had decreased body weight. Based on these data, the no-observable-effect level (NOEL) for reproductive toxicity was 375 mg/kg/day in parental animals and 125 mg/kg/day in pups.
Data Quality Reliabilities	Klimish value = 1 (Reliable without restrictions).
References	Malley, L. A. Low Dicyclopentadiene Resin Oil: Combined Repeated Dose Toxicity Study and Reproductive/Developmental Toxicity Screening Test in Rats. DuPont-13041. Report of E. I. du Pont de Nemours and Company conducted for the American Chemistry Council Olefins Panel.
Other Last changed	30-Oct-04 Robust summary prepared by contract for Olefins Panel

Low Dicyclopentadiene Resin Oil : Combined Repeated Dose Toxicity Study and Reproductive/Developmental Toxicity Screening Test in Rats

Developmental Toxicity/Teratogenicity

Test Substance	
Remarks	Low DCPD Resin Oil is a C8 to C10 distillate obtained from a pyrolysis gasoline stream produced by an ethylene production process (steam cracking process). The sample tested consisted of vinyltoluenes (17%), trimethylbenzenes (9%), styrene and methylstyrenes (3%), indene (14%), methylindene (8%), and naphthalene (1%). The balance of the composition is expected to consist of other hydrocarbons with carbon range primarily 8 to 10, mainly aromatics and olefins, with some paraffins. CAS Numbers Primary: 68477-54-3 Other Number used to represent this stream: 68516-20-1
Method	
Method/guideline followed	OECD 422
Test type	Combined repeated dose toxicity study with the reproduction/developmental screening test
GLP	Yes.
Year	2003
Species	Rat
Strain	Crl:CD® (Sprague-Dawley) IGS BR
Route of administration	Oral gavage.
Duration of test	Satellite groups of 12 young, nulliparous, nonpregnant female rats were administered an oral, daily dose of the test substance during a premating period of approximately 2 weeks, a cohabitation period of approximately 2 weeks, a gestation period of approximately 3 weeks, and a lactation period of approximately 4 days. The males were exposed for 30 days.
Doses/concentration levels	0, 35 125, or 375 mg/kg/day
Sex	12 male, 12 female per group.
Exposure period	Not applicable
Frequency of treatment	7 days/week
Control group and treatment	12 male, 12 female, corn oil vehicle.
Post exposure observation period	Not applicable.
Statistical methods	Group means and standard deviations were calculated for all measured parameters. Body weight, weight gain, food consumption, and organ weights were analyzed by Jonckheere-Terpstra trend test. Food efficiency was analyzed by one-way analysis of variance followed with Dunnett's test. Clinical observations, mating index, fertility index, and gestation index were analyzed by Cochran-Armitage trend test. Gestation length, implantation site numbers, implantation efficiency, mean number of pups per litter, percent of pups born alive, day 0-4 viability of pups, viability index, number of corpora lutea, sex ratio, pre-implantation loss, and post-implantation loss were analyzed by Jonckheere-Terpstra trend test. Mean pup weights were analyzed by linear contrast of the least square means.
Test Conditions	Satellite groups of 12 young, nulliparous, female rats were administered an oral, daily dose of 0, 35, 125, or 375 mg/kg/day during a premating period of approximately 2 weeks, a cohabitation period of approximately 2 weeks, a gestation period of approximately 3 weeks, and a lactation period of

approximately 4 days. Following the 2-week premating period, each satellite female was paired with a male of the same respective dosage group during a 2-week cohabitation period. Measurements of body weight, food consumption, and clinical signs of toxicity in females were conducted throughout premating, cohabitation, gestation, and lactation. After postpartum day 4, lactating females and nonpregnant females were sacrificed, selected organs were weighed, and selected tissues were evaluated microscopically. Offspring were evaluated for external abnormalities, and sacrificed on postnatal day 4. The study design included a main study for repeated dose toxicity end points (summarized separately).

Results

NOAEL (NOEL)

Parameters	NOEL (mg/kg/day)	NOAEL (mg/kg/d1)	LOEL (mg/kg/d1)
Systemic	35 M 35 Satellite F	35 M 35 Satellite F	125 M 125 Satellite F
Pathology			
Paternal	- M	125 M	35 M
Reproductive	375 M 375 Satellite F	375 M 375 Satellite F	- -
Reproductive	375 M 375 Satellite F	375 M 375 Satellite F	- -
Developmental (Pups)	125	125	375

LOAEL (LOEL)

See table above.

Remarks

Clinical signs and mortality: Test substance-related increases in the incidences of stained fur, and/or wet fur were observed in satellite females following administration of 375 mg/kg/day Low DCPD Resin Oil.

Maternal Body Weight and Weight Gain: Test substance-related decreases in body weight and/or weight gain were observed in satellite females administered 125 or 375 mg/kg/day of the test substance. During the premating period, body weight and weight gain of 375 mg/kg/day satellite females was 3% and 14% lower than the control values for test days 15 and 1-15, respectively. During the gestation period, body weight and weight gain of 375 mg/kg/day satellite females was 6% and 9% lower than the control values for gestation days 21 and 0-21, respectively. During lactation, body weights of 125 and 375 mg/kg/day satellite females were 8% and 7% lower than the control values on lactation day 4, respectively.

Food Consumption and Food Efficiency: There were no effects on maternal food consumption or food efficiency.

Reproductive Indices: No test substance-related effects or statistically significant differences in gestation length, number of implantation sites, implantation efficiency, pre-implantation loss, post-implantation loss, or number of *corpora lutea* were observed for any dosage of the test substance in satellite maternal females.

Offspring Parameters: Decreased mean pup weight (15% lower than the control values on lactation day 4) was observed in offspring from the 375 mg/kg/day group. No effects were observed at any dosage for the number of pups born, number of pups born alive, sex ratio, gestation index, external abnormalities, or litter survival for postnatal days 0-4 in the offspring from any dosage group.

Conclusions

Repeated administration of Low Dicyclopentadiene Resin Oil to male and female Sprague Dawley rats at dosages of 0, 35, 125, or 375 mg/kg/day

	produced no evidence of teratogenicity, however, pups from the 375 mg/kg/day group had decreased body weight. Based on these data, the no-observable-effect level (NOEL) for developmental toxicity was 125 mg/kg/day.
Data Quality	
Reliabilities	Klimish value = 1 (Reliable without restrictions).
References	Malley, L. A. Low Dicyclopentadiene Resin Oil: Combined Repeated Dose Toxicity Study and Reproductive/Developmental Toxicity Screening Test in Rats. DuPont-13041. Report of E. I. du Pont de Nemours and Company conducted for the American Chemistry Council Olefins Panel.
Other	
Last changed	30-Oct-04 Robust summary prepared by contract for Olefins Panel